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CHASSELL # RELATION BETWEEN  
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# THE RELATION BETWEEN MORALITY AND INTELLECT

*A Compendium of Evidence Contributed by  
Psychology, Criminology, and Sociology*

BY

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*Dedicated to My Parents*

OLIN BOSWORTH CHASSELL

*and*

ELLA BUCKINGHAM CHASSELL

*whose keen interest in learning served to kindle my  
own, and whose sacrifices made possible unusual  
educational advantages for their children and mate-  
rially aided in the preparation of this book*

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## PREFACE

THIS volume is devoted to a consideration of the relation between morality and intellect, and constitutes a compendium of evidence contributed by psychology, criminology, and sociology.

Pursuing her investigations concurrently with other activities, the author has expended much of her available research time over a nineteen-year period in a study of the nature of this relationship. She trusts that the publication of this volume may serve persons interested in social psychology, in which field the subject matter of the book more particularly lies, and investigators in allied psychological, sociological, and educational fields as well. The desired outcomes of the research may be formulated as follows:

1. That the interpretation of the problem of the relation between morality and intellect to include the relation between delinquency and mental inferiority as well as the relation between moral character and intelligence, and the resulting inclusion of data for feeble-minded, delinquent, and non-delinquent groups, may serve to unify a problem ordinarily considered as twofold, and customarily studied by different investigators.

2. That the incorporation in the research of the findings of nearly three hundred studies pursued by many investigators in this country and abroad may have resulted in conclusions of unusual validity.

3. That the detail in the presentation of the results of these studies may enable future investigators of the relation between morality and intellect to orient themselves in the problems under consideration, to define the gaps in present knowledge, to plan their own researches accordingly, and subsequently to compare the findings of these researches, even while they are in process, with the findings of previous investigations.

4. That the tabular reviews which appear throughout the book, and which constitute the characteristic method of presenting results, may serve as a pattern for future investigations of the types included in this volume, and may suggest the possibility of standardizing the method of report for many subjects relatively unrelated to the problem of major consideration in the present work.

5. That the assembling within the limits of this volume of one of the most extensive collections of data that have ever been

brought together in the social sciences for a single purpose, showing the relation between morality and intellect for three types of subjects, including more than eleven thousand feeble-minded persons, approximately three hundred thousand delinquents, and nearly twelve thousand non-delinquents, may have provided a reference work of considerable usefulness to research workers in psychology and criminology, and also of definite interest to sociologists, educators, school and clinical psychologists, and social workers.

6. That the statistical reduction of the non-correlational studies by a correlational procedure in order to make possible their synthesis with other studies, although accomplished in this instance by a comparatively crude method, may prove of value in itself, and at the same time may direct attention to the possibility of expressing in similar terms the findings of many investigations pursued by diverse methods.

7. That the investigations made by the author herself, although undertaken before certain more refined tools of research had been developed, and before the critical consideration of both tools and methods, now common, had come into vogue, may contribute in worthy measure to the growing literature in the field.

8. That the research as a whole may have determined within fairly narrow limits the relation between morality and intellect in restricted groups.

9. Finally, that the ground may now be cleared for a comprehensive investigation of the relation between morality and intellect by means of improved measures and refined statistical procedures, and in carefully selected groups fairly representative of the general population, so that generalization regarding the relation between morality and intellect in the population as a whole may have an adequate basis.

It should be noted that, although the desired outcomes of the research are formulated above in terms of the present volume, with very little change a number of these statements also apply to a separate monograph by the author, entitled *A Comparative Study of Delinquents and Non-Delinquents*, which grew out of the present volume and is closely related to it.\* The division of labor between the two books is indicated in the following explanation:

The present volume gives a detailed account of the research as a whole, and contains, on the one hand, reviews and syntheses of studies of the relation between morality and intellect by many in-

\* Until this monograph is available in printed form, it may be consulted by arrangement with the author. Address Clara Chassell Cooper, in care of the Bureau of Publications, Teachers College, Columbia University, New York City.

investigators, including an abridged review of non-correlational studies of the relation between delinquency and mental inferiority, and tabular reviews and syntheses of correlational studies of this relationship and of the relation between moral character and intelligence; and, on the other hand, reports of two investigations of the relation between morality and intellect by the author, the first of the relation between moral and intellectual traits, and the second of the relation between conduct and intelligence, which in their turn include tabular reviews and syntheses of the investigations reported.

It will be noted that in the case of the non-correlational studies an abridged review takes the place of a tabular review. This departure from the characteristic method of presenting results is due to the fact that the detailed tables upon which the abridged review is based were sufficiently extensive to call for presentation elsewhere. The separate monograph meets this need, and presents the tabular review of non-correlational studies of the relation between delinquency and mental inferiority. This tabular review consists of a series of detailed tables which afford comparisons between paired feeble-minded and non-feeble-minded groups as to delinquency, and between paired delinquent and non-delinquent groups as to mental deficiency, illiteracy, amount of schooling, school progress, educational achievement, intellectual deficiency, verbal abstract intelligence, mental ability, non-verbal concrete intelligence, and mechanical intelligence.

Although a detailed presentation of the non-correlational studies is thus not accorded in the present volume, all the types of data represented in the detailed tables of the tabular review of these studies are summarized in the abridged review, and the most significant results included in the tables have been subjected to statistical reduction by means of a correlational procedure, and are thereby incorporated in the tabular review of correlational studies of the relation between delinquency and mental inferiority.

In the formulation of the desired outcomes of the research certain possible uses of the tabular reviews included in this volume, which inhere in like manner and in even greater measure in the tabular review included in the separate monograph, were suggested. These uses transcend the boundaries of the present research, and are of such importance that explanation and elaboration may be in order.

In the tabular reviews included in the two books the author presents in a uniform manner the findings of investigations as to the relation between morality and intellect which employ the following diverse types of data, constituting the types of evidence under consideration in the research:

REPORTS CONCERNING DELINQUENCY.

ESTIMATES OF MENTAL DEFICIENCY.

RATINGS AS TO INTELLIGENCE: Ratings as to Abstract Intelligence, Ratings as to Social Intelligence, Ratings as to Abstract and Social Intelligence.

REPORTS OF EDUCATIONAL STATUS: Reports of Illiteracy, Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement.

REPORTS OF EXTRA-CURRICULAR ACTIVITIES.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Army Mental Tests, Results of Tests of Non-Verbal Concrete Intelligence, Results of Tests of Mechanical Intelligence.

The uniformity in presentation has been accomplished by the unvarying selection from the source, whatever the type of data in process of tabulation, of certain prescribed information. In the case of the non-correlational studies presented in the separate monograph the items prescribed for tabulation included authority, date of investigation, date of publication, group, number of cases, and selected findings of critical import and diagnostic significance. These were tabulated in identical form for the experimental (feeble-minded or delinquent) group and for the control (non-feeble-minded or non-delinquent) group. In the case of the correlational studies presented in this volume the items prescribed for tabulation included authority, date of investigation, date of publication, group, number of cases, measures (qualified as appropriate for the particular studies concerned), and detailed information regarding the correlational result.

The items enumerated would appear to represent minimum essentials that should be a routine matter of report in scientific investigation of this character. Unfortunately, however, many of the facts called for in the tabulations were frequently lacking in reviews of the literature, and even in the original reports of individual investigations. Furthermore, even if available in the source, the desired information was often obscured or limited in usefulness by the manner of presentation.

The difficulties encountered in the compilation of investigations contributing evidence as to the relation between morality and intellect have led the author to formulate certain suggestions designed to lighten the task of the reviewer, and—far more important—to insure greater adequacy in the presentation of the results of kin-



dred types of research in psychology and the allied sciences. These suggestions follow :

1. That investigators adopt a uniform tabular method of report, including the prescribed items enumerated above, or, preferably, prescribed minimum essentials of report formulated by an authorized standardization committee.

2. That investigators employ the prescribed tabular form, in so far as it is appropriate and economical of application to their particular problems, as the essential method of reporting their scientific investigations, presenting distributions of original data at the same time, if practicable.

3. That investigators confine themselves to the prescribed tabular method of report as the sole method of presenting their results in certain instances in which brevity is important; for example, in cases in which abstracts or summaries are called for.

4. That compilers present as the basic feature of their compilations tabular reviews of literature which conform to the prescribed tabular method of report.

5. That editors of research publications, after official action with respect to standardization has been taken by the appropriate associations of scientists, postpone the publication of inadequate manuscripts until the authors shall have supplied the prescribed minimum essentials of report.

Since uniformity in the method of reporting scientific investigation tends to permit the synthesis of related studies, it would appear to be prerequisite to well-ordered research. Consequently the adoption of the program outlined above should lay the foundation for important economizing of effort in investigation.

With regard to the book itself, the author wishes to state that it incorporates the material of the dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Faculty of Philosophy, Columbia University, by the author in 1920. In addition, it incorporates related material collected at that time but not then ready for presentation, and introduces certain refinements in the presentation and in the statistical treatment of the data. Furthermore, although the general organization of the book follows the organization of the material in the dissertation, the whole of the text has been rewritten, and the summary of previous statistical and experimental studies has been very greatly expanded, extended to include many important studies published since that time, subjected to a uniform tabular

method of report, synthesized, and merged in a compilation of the correlational results of the research as a whole.

Finally, the author desires to express her appreciation to the many persons who have coöperated in this research. She is especially indebted to Professor Edward L. Thorndike of Teachers College, Columbia University, who suggested the problem of the relation between morality and intellect, and guided the two original investigations which constitute Parts II and III of the present volume; to Professor Robert H. Gault of Northwestern University, who called attention to the problem of the relation between delinquency and mental deficiency, and directed a preliminary investigation, which is published in part as Appendix I, Section I, of this book; to Dr. Laura M. Chassell, now Mrs. Herbert A. Toops, of Columbus, Ohio, who gave valuable assistance in almost every phase of the research, and who aided in the preparation of the chart from which the conduct scales utilized in the investigation were derived, and suggested and collaborated in the construction of equivalent conduct scales based on this chart; to Dr. and Mrs. Olin B. Chassell of Mount Vernon, Iowa, who provided funds to aid in the completion of the research, and lent encouragement and help in many ways throughout the years; to Mrs. Siegfried M. Upton of the Horace Mann School, Teachers College, Columbia University, who collaborated in the preparation of the chart from which the conduct scales utilized in the investigation were derived, and aided in the preparation of these scales; to Professor Truman L. Kelley, now of Harvard University, who gave statistical advice over a period of years, and adapted certain formulae to the needs of the research; to Professor James B. Miner of the University of Kentucky, who made various critical suggestions with reference to the tabular review of non-correlational studies of the relation between delinquency and mental inferiority, and with reference to the interpretation of results, and who afforded counsel and co-operation in problems concerned with publication; to Professor Herbert A. Toops of the Ohio State University, who advised concerning a number of statistical problems, particularly those having to do with the correlational analysis of the data; to Professor Henry A. Ruger of Teachers College, Columbia University, who gave suggestive criticism of procedure and of the interpretation of results; to Professor William A. McCall, also of Teachers College, Columbia University, who contributed helpful suggestions in

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CLARA CHASELL COOPER

*November 15, 1935*



# CONTENTS

CHAPTER	INTRODUCTION	PAGE
I. THE STATEMENT OF THE PROBLEM .....		3
II. AN OUTLINE OF PROCEDURE .....		6
PART I. REVIEWS AND SYNTHESSES OF STUDIES OF THE RELATION BETWEEN MORALITY AND INTELLECT BY MANY INVESTIGATORS		
PART I A. STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY		
III. A BRIEF SURVEY OF STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY .....		15
Section 1. A Description of the Studies Reviewed in the Investigation of the Relation between Delinquency and Men- tal Inferiurity .....		16
Section 2. An Analysis of the Three Primary Methods of Classification Employed in the Research as Applied to Studies in Feeble-Minded and Delinquent Groups .....		18
IV. AN ABRIDGED REVIEW OF NON-CORRELATIONAL STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERI- ORITY .....		20
Section 1. Reports concerning Delinquency in Paired Feeble- Minded and Non-Feeble-Minded Groups.....		23
Section 2. Estimates of Mental Deficiency in Paired Delin- quent and Non-Delinquent Groups.....		26
Section 3. Reports of Educational Status in Paired Delin- quent and Non-Delinquent Groups .....		29
Section 4. Results of Intelligence Tests in Paired Delin- quent and Non-Delinquent Groups .....		38
V. AN ACCOUNT OF THE STATISTICAL REDUCTION OF THE NON- CORRELATIONAL STUDIES .....		52
Section 1. The Calculation of Pooled Percentages.....		52
Section 2. The Calculation of Coefficients of Colligation....		57
VI. A TABULAR REVIEW OF CORRELATIONAL STUDIES OF THE RE- LATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY ..		66
Section 1. Coefficients of Colligation between Measures of Delinquency and Mental Inferiurity Obtained by the Sta- tistical Reduction of the Non-Correlational Studies .....		67
Section 2. Coefficients of Colligation between Measures of De- linquency and Mental Inferiurity Reported in the Literature		91
Section 3. Correlation Ratios between Measures of Delin- quency and Mental Inferiurity .....		96
Section 4. Tetrachoric Coefficients of Correlation between Measures of Delinquency and Mental Inferiurity.....		103
Section 5. Rank-Difference Coefficients of Correlation be- tween Measures of Delinquency and Mental Inferiurity ...		114

Section 6. Product-Moment Coefficients of Correlation between Measures of Delinquency and Mental Inferiority ...	118
VII. A SYNTHESIS OF STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY .....	129
PART I B. STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE	
VIII. A BRIEF SURVEY OF STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE .....	137
Section 1. A Description of the Studies Reviewed in the Investigation of the Relation between Moral Character and Intelligence .....	137
Section 2. An Analysis of the Three Primary Methods of Classification Employed in the Research as Applied to Studies in Non-Delinquent Groups .....	140
IX. A TABULAR REVIEW OF CORRELATIONAL STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE ....	142
Section 1. Tetrachoric Coefficients of Correlation between Measures of Moral Character and Intelligence .....	143
Section 2. Rank-Difference Coefficients of Correlation between Measures of Moral Character and Intelligence ....	147
Section 3. Product-Moment Coefficients of Correlation between Measures of Moral Character and Intelligence ....	156
X. A SYNTHESIS OF STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE .....	193
PARTS II AND III. REPORTS OF TWO INVESTIGATIONS OF THE RELATION BETWEEN MORALITY AND INTELLECT BY THE AUTHOR	
PART II. AN INVESTIGATION OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS	
XI. AN EXPLANATION OF THE GENERAL PLAN FOLLOWED IN STUDIES OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS .....	199
Section 1. The Determination of the Main Outlines of the Investigation of the Relation between Moral and Intellectual Traits .....	199
Section 2. The Supplementation of the Principal Study ....	206
XII. A TABULAR REVIEW OF THE INVESTIGATION OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS .....	209
A STUDY OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS	
XIII. A PRELIMINARY SURVEY OF THE STUDY OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS ....	215
Section 1. A Summary of the Returns Received from Faculty and Student Judges.....	215
Section 2. A Concrete Description of the Typical Institutions Contributing to the Conclusions of the Study.....	218
XIV. AN ACCOUNT OF THE PROCURING OF THE DATA .....	220
Section 1. An Outline of the Methods Employed in Obtaining the Cooperation of the Institutions .....	220
Section 2. A Description of the Procedures Utilized in Securing the Aid of the Judges .....	222

CHAPTER	PAGE
XV. AN ANALYTICAL STUDY OF THE COOPERATING INSTITUTIONS AND OF THE PERSONS WHO SERVED AS SUBJECTS OR JUDGES ..	225
Section 1. An Analysis of Geographical Location, Affiliation or Control, and Type of Institution .....	225
Section 2. A Description of the Subjects .....	227
Section 3. A Description of the Judges .....	229
XVI. AN ANALYTICAL STUDY OF THE RETURNS .....	231
Section 1. A Quantitative Study of the Returns .....	231
Section 2. A Qualitative Study of the Returns.....	236
XVII. AN ACCOUNT OF THE STATISTICAL TREATMENT OF THE DATA	241
Section 1. A Description of the Method of Recording the Data .....	241
Section 2. An Outline of the Treatment of Faulty Data....	242
Section 3. An Explanation of the Procedures Required in the Correlational Analysis of the Data .....	247
XVIII. AN EXPLANATION OF THE EVALUATION OF THE DATA .....	254
Section 1. A General Account of the Criteria Employed in the Evaluation of the Data.....	254
Section 2. An Analysis of the Final Grades and the Com- posite Scores Obtained as a Result of the Application of the Criteria Employed .....	258
XIX. THE PRESENTATION AND INTERPRETATION OF THE CORRELA- TIONAL RESULTS FOR RATINGS BY FACULTY AND STUDENT JUDGES .....	261
Section 1. Coefficients of Correlation between Ratings in Moral and Intellectual Traits by Faculty Judges.....	261
Section 2. Coefficients of Correlation between Ratings in Moral and Intellectual Traits by Student Judges .....	267
Section 3. Coefficients of Intercorrelation between Ratings in Moral Traits by Student Judges .....	275
Section 4. Coefficients of Correlation between Ratings in Moral and Intellectual Traits and Composites of Ratings in Moral and Intellectual Traits .....	283
Section 5. Coefficients of Cross-Correlation between Ratings by Faculty Judges and Ratings by Student Judges .....	287
<i>STUDIES OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS AND OBJECTIVE MEASURES OF INTELLIGENCE</i>	
XX. A STUDY OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS AND COLLEGE MARKS .....	294
Section 1. A Consideration of the Value of Records of Col- lege Marks as a Measure of Intelligence .....	294
Section 2. A Description of the Data Obtained for a Study Involving Records of College Marks .....	296
Section 3. An Explanation of the Procedures Required in Determining the Correlation with College Marks .....	297
Section 4. The Presentation and Interpretation of the Corre- lational Results for College Marks .....	303
XXI. A STUDY OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS AND EXTRA-CURRICULAR ACTIVITIES	312
Section 1. A Consideration of the Value of Reports of Extra- Curricular Activities as a Measure of Intelligence .....	312

Section 2. A Description of the Data Obtained for a Study Involving Reports of Extra-Curricular Activities .....	313
Section 3. An Explanation of the Procedures Required in Determining the Correlation with Extra-Curricular Activities .....	315
Section 4. The Presentation and Interpretation of the Correlational Results for Extra-Curricular Activities .....	319
XXII. A SYNTHESIS OF THE INVESTIGATION OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS .....	331
Section 1. An Explanation of the Method of Combining Coefficients of Correlation for College Students .....	331
Section 2. A Compilation of the Correlational Results of Studies of the Relation between Moral and Intellectual Traits .....	333
Section 3. A Comparison between a Quantitative and a Qualitative Method of Weighting the Correlational Results of the Investigation .....	337
PART III. AN INVESTIGATION OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE	
XXIII. AN EXPLANATION OF THE METHOD OF MEASURING MORALITY EMPLOYED IN STUDIES OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE .....	341
Section 1. The Construction of the Measures of Morality Utilized in the Investigation of the Relation between Conduct and Intelligence .....	341
Section 2. The Determination of the Reliability of the Measures Constructed .....	348
XXIV. A TABULAR REVIEW OF THE INVESTIGATION OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE .....	353
<i>STUDIES OF THE CORRELATION BETWEEN SCORES IN CONDUCT AND INTELLIGENCE</i>	
XXV. A PRELIMINARY SURVEY OF THE STUDIES OF THE CORRELATION BETWEEN SCORES IN CONDUCT AND INTELLIGENCE .....	357
Section 1. An Outline of the Three Studies .....	357
Section 2. A Summary of the Data Obtained from Private and Public Schools .....	358
XXVI. A STUDY OF THE CORRELATION BETWEEN CONDUCT SCORE AND MENTAL SURVEY SCORE .....	360
Section 1. A Description of the Data and the Subjects Represented in the Study Employing Mental Survey Score as the Measure of Intelligence.....	360
Section 2. An Explanation of the Procedures Required in Determining the Correlation with Mental Survey Score ...	361
Section 3. The Presentation and Interpretation of the Correlational Results for Mental Survey Score.....	363
XXVII. A STUDY OF THE CORRELATION BETWEEN CONDUCT SCORE AND INTELLIGENCE QUOTIENT .....	367
Section 1. A Description of the Data and the Subjects Represented in the Study Employing Intelligence Quotient as the Measure of Intelligence .....	367
Section 2. An Explanation of the Procedures Required in Determining the Correlation with Intelligence Quotient ...	371



CHAPTER	PAGE
Section 3. The Presentation and Interpretation of the Correlational Results for Intelligence Quotient .....	374
XXVIII. A STUDY OF THE CORRELATION BETWEEN CONDUCT SCORE AND MENTAL AGE .....	379
Section 1. A Description of the Data and the Subjects Represented in the Study Employing Mental Age as the Measure of Intelligence .....	379
Section 2. An Explanation of the Procedures Required in Determining the Correlation with Mental Age .....	380
Section 3. The Presentation and Interpretation of the Correlational Results for Mental Age .....	384
XXIX. A SYNTHESIS OF THE INVESTIGATION OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE .....	392
Section 1. An Explanation of the Method of Combining Coefficients of Correlation for School Children .....	392
Section 2. A Compilation of the Correlational Results of Studies of the Relation between Conduct and Intelligence .....	394
CONCLUSION	
XXX. A COMPARATIVE STUDY OF THE THREE PARTS OF THE RESEARCH .....	399
Section 1. A Comparison of the Three Parts of the Research as to Types of Evidence, Types of Groups, and Countries .....	399
Section 2. A Comparison of the Three Parts of the Research as to Correlational Results .....	401
XXXI. A SYNTHESIS OF THE SEVERAL INVESTIGATIONS OF THE RELATION BETWEEN MORALITY AND INTELLECT INCLUDED IN THE RESEARCH .....	405
Section 1. An Explanation of the Method of Combining Coefficients of Correlation for All Types of Subjects .....	405
Section 2. A Compilation of the Correlational Results of Investigations of the Relation between Morality and Intellect .....	409
Section 3. A Graphic Interpretation of the Correlational Results of the Research .....	411
XXXII. A CONSIDERATION OF VARIOUS FACTORS WHICH AFFECT THE CORRELATIONAL RESULTS OF THE RESEARCH .....	419
Section 1. An Analysis of the Effect of Different Types of Subjects .....	419
Section 2. An Analysis of the Effect of Different Types of Evidence, Types of Groups, Countries, and Types of Coefficients .....	431
Section 3. An Analysis of the Effect of Chance Inaccuracies in the Original Measures .....	462
XXXIII. A SUMMARY AND EVALUATION OF THE FINDINGS OF THE RESEARCH AS TO THE RELATION BETWEEN MORALITY AND INTELLECT .....	469
Section 1. The Final Conclusion of the Research as to the Relation between Morality and Intellect .....	470
Section 2. The Findings of the Character Education Inquiry as Independent Evidence of the Relation between Morality and Intellect .....	473
Section 3. The Significance of the Relationship Revealed in the Research .....	488

## APPENDICES

I. SUPPLEMENTARY MATERIAL PERTAINING TO PART I .....	495
Section 1. A Study of the Relation between Delinquency and Mental Deficiency .....	495
Section 2. A Study of the Relation between Character and Intellect .....	502
Section 3. The Principles of Selection Followed in Excluding Certain Measures of Character and Personality and in Classifying Ratings as to Intelligence .....	506
II. SUPPLEMENTARY MATERIAL PERTAINING TO PART II .....	509
Section 1. A Key to the Institutions Cooperating in the Investigation of the Relation between Moral and Intellectual Traits .....	509
Section 2. Detailed Rules Governing the Report and the Interpretation of Routine Correlational Results Obtained for Selected Institutions .....	511
Section 3. Correlational Results Obtained for Non-Selected Institutions and Supplementary Coefficients of Correlation Calculated for Selected Institutions .....	512
Section 4. A Definition of the Standards for the Criteria Employed in the Evaluation of the Data with the Grades Assigned as the Result of Each Criterion .....	518
Section 5. The Adapted Point Systems Used in the Evaluation of Extra-Curricular Activities .....	522
III. SUPPLEMENTARY MATERIAL PERTAINING TO PART III .....	525
Section 1. A Key to the Schools Included in the Investigation of the Relation between Conduct and Intelligence ...	525
Section 2. Detailed Information regarding the Data Utilized in the Three Studies and Supplementary Coefficients of Correlation Calculated between Scores in Conduct and Intelligence .....	526-527
Section 3. Statistical Information Derived from the Frequency Distributions of the Measures Employed in the Three Studies .....	531
Section 4. The Steps in Assigning Credit for Omitted Items and in the Subsequent Calculation of the Conduct Score ..	533
IV. AN ANALYSIS OF THE INDIVIDUAL COEFFICIENTS TABULATED IN THE THREE PARTS OF THE RESEARCH .....	534
Section 1. A Frequency Distribution of the Coefficients Showing the Degree of Relationship Found between Delinquency and Mental Inferiority .....	534
Section 2. A Frequency Distribution of the Coefficients Showing the Degree of Relationship Found between Moral Character and Intelligence .....	536
V. SELECTED BIBLIOGRAPHY .....	538
Section 1. References Utilized in Studies of the Relation between Delinquency and Mental Inferiority .....	538
Section 2. References Utilized in Studies of the Relation between Moral Character and Intelligence .....	545
INDEX OF AUTHORS .....	551
INDEX OF SUBJECTS .....	553

THE RELATION BETWEEN MORALITY  
AND INTELLECT

*A Compendium of Evidence Contributed by  
Psychology, Criminology, and Sociology*

*"If morality and intellect are finally demonstrated to be correlated throughout the whole range of individual differences, it is probably the most profoundly significant fact with which society has to deal."*

—J. B. MINER, *Proceedings and Addresses of the American Association for the Study of the Feeble-Minded*, 1919, page 54.

## INTRODUCTION



## CHAPTER I

### THE STATEMENT OF THE PROBLEM

**I**N AN essay entitled "The Moral Obligation to Be Intelligent," Erskine gives in illustration of his assertion that the praise of intelligence is not one of the characteristic glories of our literature, a quotation from an English author which implies that a person who chooses to be good must needs leave it to others to be clever. He then comments as follows:

"Here is the startling alternative which to the English, alone among great nations, has been not startling but a matter of course. Here is the casual assumption that a choice must be made between goodness and intelligence; that stupidity is first cousin to moral conduct, and cleverness the first step into mischief . . ." (139, p. 5)<sup>1</sup>

The supposition that goodness and intelligence are relatively antagonistic is a natural outcome of the popular and widely held theory of compensation, concretely described by Woods as "the notion that the poor, the sick, the stupid and the generally unfortunate are 'the pure in heart'" (cf. 211, p. 84). Strangely enough, this notion is held in spite of the fact that such an interpretation of the Beatitude referred to is belied by the conception implicit in the Parable of the Talents, since in this narrative the servants to whom more than one talent was entrusted by reason of their superior ability gave a good account of their stewardship, whereas the man who because of his lesser ability received but one talent proved untrustworthy.

Within recent years, however, as the spirit of inquiry has applied itself increasingly to the problems of human nature and conduct, the question has been more and more insistently raised as to whether compensation is, after all, the rule in human affairs.

<sup>1</sup> Throughout the research, numbers in parentheses refer to the references listed in the selected bibliography in Appendix V.

With reference to the use of quoted material in the research, it should be explained that, in order to avoid confusion, designations of footnotes included in the original source have been omitted without any indication of such omission unless the footnote itself was also quoted.

Woods' opinion, no doubt based in part upon his own important pioneer research regarding the correlation between mental and moral qualities (cf. 212, pp. 255-64), is emphatically contrary to the popular conception. In an article which seeks to establish the thesis that good qualities are correlated, he says:

"That the exact opposite happens to be the truth, will not interest certain types of emotional and sentimental reformers; but persons desirous of promoting the science of heredity in its application to human problems may be interested in the evidence that accumulates from time to time, *all of which* points in one direction." (211, p. 84)

Similarly Thorndike, one of the leading investigators of the relationship between qualities, in an article on intelligence and its uses makes this statement:

". . . in human nature good traits go together. To him that hath a superior intellect is given also on the average a superior character; the quick boy is also in the long run more accurate; the able boy is also more industrious. There is no principle of compensation whereby a weak intellect is offset by a strong will, a poor memory by good judgment, or a lack of ambition by an attractive personality. Every pair of such supposed compensating qualities that have been investigated has been found really to show correspondence." (194, pp. 233-34)

In an earlier article discussing the subject of eugenics with special reference to intellect and character he declares:

"Nature does not balance feeble-mindedness by great manual dexterity, nor semi-insane eccentricities by great courage and kindness. Correlation of divergences up or down from mediocrity is the rule, not compensation. The child of good reasoning powers has better, not worse, memory than the average; the child superior in observation is superior in inference; scholarship is prophetic of success out of school; a good mind means a better than average character." (193, pp. 131-32)

These investigators are not alone in their opinion. Indeed, so practically unanimous and unequivocal have been the results of inquiries into the mutual relationship of desirable qualities that the principle now appears to be established that correlation and not compensation is the rule.

Although the investigations of such relationships have been numerous as well as convincing, in the case of many pairs of qualities the degree of correlation is still in doubt. Thus one



question as yet inadequately answered is that of the relation between morality and intellect. Yet the answer to this question is exceedingly important both theoretically and practically: theoretically, because it will make possible a more enlightened public opinion upon such problems as exceptional educational opportunities for gifted children, the possible dangers of an intellectual aristocracy, race suicide among the highly educated, the isolation of the feeble-minded, the sterilization of criminals, and proper emphases in social work; practically, because it will serve as a guide in the improvement of society through training and eugenics, and in the productive utilization of man-power in every field of human endeavor, whether religion, education, industry, philanthropy, or government.<sup>2</sup>

The research reported in this volume was undertaken to define more exactly the relation between morality and intellect.<sup>3</sup> The problem for investigation was interpreted to include the relation between delinquency and mental inferiority as well as the relation between moral character and intelligence, and is thus concerned with the nature of the relationship in feeble-minded and delinquent and in non-delinquent groups.

As a means of introducing the subject under investigation, the statement of the problem has been formulated in this opening chapter, while an outline of procedure is provided in the chapter which follows.

<sup>2</sup> Compare the discussions of this subject by Miner (74, pp. 53-54) and by Thorndike (194, p. 234).

<sup>3</sup> At the outset it may be well to state that the terms *morality* and *intellect* are used for classificatory purposes, only, to cover the various related terms used in the studies by the author and by other investigators which are included in this book. Persons requiring definitions may arrive at them inductively by consulting the tabular reviews throughout the volume, by considering more or less explicit definitions of several of these terms which are given at the beginning of Chapters III and VIII, and by noting certain measures of character and personality which are explicitly excluded, as explained in the first section of Chapter VIII.

## CHAPTER II

### AN OUTLINE OF PROCEDURE

THE research culminates in a compendium of evidence bearing upon the relation between morality and intellect contributed by psychology, criminology, and sociology, which incorporates the findings of nearly three hundred studies pursued by many investigators in this country and abroad. Part I consists of reviews and syntheses of studies of the relation between morality and intellect by many investigators, including studies of the relation between delinquency and mental inferiority and studies of the relation between moral character and intelligence. Parts II and III contain reports of two investigations of the relation between morality and intellect by the author, including an investigation of the relation between moral and intellectual traits, and an investigation of the relation between conduct and intelligence, each in turn comprehending a number of studies of the relation between moral character and intelligence.

The method of study employed in the research may be defined as statistical, comparative, and synthetic.

The characteristic statistical technique utilized is correlational. In the case of Parts II and III the studies reported are exclusively correlational in type. In the case of Part I, however, both non-correlational and correlational studies are included,<sup>1</sup> although the former type is limited to studies of the relation between delinquency and mental inferiority. The desirability of including both non-correlational and correlational studies in the first part of the research is apparent from the fact that studies of the relation between delinquency and mental inferiority and studies of the relation between moral character and intelligence typically utilize diverse methods of investigation. Thus studies in feeble-minded

<sup>1</sup> In this research *correlational studies* as contrasted with *non-correlational studies* are taken to signify studies which report such measures of relationship as coefficients of colligation, correlation ratios, and tetrachoric, rank-difference, and product-moment coefficients of correlation.

and delinquent groups, which are practically synonymous with studies of the relation between delinquency and mental inferiority, are principally non-correlational, and seek to ascertain the extent of moral inferiority among the feeble-minded, with or without comparison with the non-feeble-minded as a control, or the extent of mental inferiority among delinquents, with or without comparison with non-delinquents as a control; whereas studies in non-delinquent groups, which are practically synonymous with studies of the relation between moral character and intelligence, are almost exclusively correlational, and essay to determine the relation between various measures of moral character and intelligence.

The distinctive use of the comparative method is to be found only in the case of the non-correlational studies. In the initial presentation of these studies in a separate monograph,<sup>2</sup> diverse types of data reported in the literature are tabulated in a uniform manner for a large number of experimental groups and appropriate control groups,<sup>3</sup> the items prescribed for tabulation for the groups compared being identical, and the individual entries being matched in so far as the data available in the sources permit. The abridged presentation of these studies in the present volume summarizes the most significant data included in this comparative study, but does not preserve the uniform tabular method of report employed in the unabridged review.

The synthesis of the several divisions of the research and the eventual synthesis of the entire research were made possible by the following means: (1) the utilization of a uniform tabular method of report in presenting the correlational results of the various studies included in the three parts of the research; and

<sup>2</sup> The relation between the present volume and the separate monograph, entitled *A Comparative Study of Delinquents and Non-Delinquents*, will be indicated in detail in Chapter IV.

<sup>3</sup> It should be explained at the outset that the terms *experimental group* and *control group* are used in this research in a very general sense, to denote in the first instance any feeble-minded or delinquent group for which data are tabulated, and in the second instance any non-feeble-minded or non-delinquent group selected for comparison with one of these experimental groups, the experimental and the control groups thus compared being referred to as paired groups.

Since the expression *paired groups* is frequently used to refer to experimental and control groups the individual members of which have been paired, its broader application in this research to experimental and control groups which have been paired group by group only should be particularly noted. In its present usage *comparable groups* is an equivalent expression.

(2) the statistical reduction of the non-correlational studies by a correlational procedure which permitted their incorporation in the appropriate tabular review of correlational studies. As a result, the synthesis itself could be accomplished by the combination of the correlational results for a given division of the research, or for the research as a whole, by relatively simple statistical procedures.

The general plan of the research has certain distinctive features which may now be described. These include a uniform method of organization, a uniform method of tabulation, a pattern method of presentation, and a uniform basis of interpretation.

The uniform method of organization utilized throughout the research involves three primary methods of classification,—so called because they are the only methods of classification characteristic of both the non-correlational and the correlational studies,—in terms of types of evidence, types of groups, and countries.<sup>4</sup>

The first primary method of classification, the classification according to types of evidence, is the fundamental method of classification underlying the presentation of data throughout the research. This method of classification differentiates the major and minor types of evidence<sup>5</sup> as to the relation between morality and intellect contributed by the data tabulated, and is essentially a classification according to the measures of intellect employed in the particular studies contributing data bearing upon the problem under consideration, or, briefly, a classification in terms of the measures of intellect employed.<sup>6</sup>

Superimposed upon the fundamental method of classification in terms of types of evidence is the second primary method of classification, the classification according to types of groups. This method of classification distinguishes the principal types of feeble-minded, non-feeble-minded, delinquent, or non-delinquent groups repre-

<sup>4</sup> By way of emphasis, throughout the research the application of the three primary methods of classification will be marked by the use of initial capital letters in designating types of evidence, types of groups, and countries.

<sup>5</sup> The expression *major and minor types of evidence* is used in this research to refer to the classification of the evidence by hierarchies from the logical standpoint, and should not be construed to refer in any way to the relative importance of the types of evidence so classified.

<sup>6</sup> The only instance in which the method of classification utilized is not actually a classification in terms of measures of intellect is that in which a measure of morality for paired feeble-minded and non-feeble-minded groups replaces a measure of intellect for paired delinquent and non-delinquent groups, that is, in the case of Reports concerning Delinquency.

sented by the several types of evidence for which data are tabulated, and is thus a classification in terms of the general types of groups to which the particular experimental or control groups under consideration should be assigned.<sup>7</sup>

In turn superimposed upon the second primary method of classification in terms of types of groups is the third primary method of classification, the classification according to countries. This method of classification distinguishes the countries represented by the types of groups to which the measure of intellect under consideration was applied, and is thus a classification in terms of the countries represented by the particular experimental or control groups under consideration.

In the case of the non-correlational studies a number of additional methods of classification applicable to a particular type of data are employed. These methods of classification afforded the designations for the major and minor divisions of the corresponding detailed tables of the tabular review of non-correlational studies, and the more important headings utilized in that connection are retained in the abridged review of these studies and in the table presenting the correlational results obtained as a result of their statistical reduction, but are not preserved in the synthesis of the studies in question.

In the case of the correlational studies an additional method of classification in terms of types of coefficients is employed. This method of classification accounts for the assignment of the several types of coefficients to separate tables in the tabular reviews of correlational studies, and is a classification in terms of the measures of relationship to which the correlational results for a particular series of studies should be assigned. Because of its statistical importance this further principal method of classification is retained, together with the primary methods of classification, in the synthesis of the correlational results for the research as a whole.

The uniform method of organization described above has been employed throughout the research in conjunction with a uniform

<sup>7</sup> Since these types of groups may be thought of as *groups* as well as *types of groups*, aside from its use in connection with the various methods of classification the significance of the latter term as employed in the research lies particularly in the occasional necessity for distinguishing types of groups from the individual groups which may be subsumed under them. Throughout the research, therefore, when such a distinction is unimportant or has already been made, the more convenient term *group* will be used.

method of tabulation. This method of tabulation calls for the application of a uniform tabular method of report to the different series of studies included in the research, which as already indicated provides a means for their later synthesis. The general requirement of this method of report is that every table included in the initial presentation of results shall have as essential features, first, a general heading which shall characterize the subjects for whom data are tabulated, and, secondly, a number of detailed headings which shall be identical throughout the tables of a given tabular review except for the distinctive headings applicable to the data included in a particular table.

The general headings utilized in the tabular reviews of correlational studies appearing throughout the volume are FEEBLE-MINDED, NON-FEEBLE-MINDED, DELINQUENT, and NON-DELINQUENT. The identical detailed headings utilized in the individual tables, regardless of the types of evidence represented, are *Authority*, *Date of Investigation*, *Date of Publication*, *Group* (or *Type of Group and Country* in the presentation of a series of combined rather than individual studies), *No. of Cases*, and *Measures* (subdivided into *Delinquency* and *Mental Inferiority* or *Moral Character* and *Intelligence*, according to the series of studies for which data are tabulated). The distinctive headings applied to a particular table depend upon the data available, and call for detailed information regarding the correlational results.<sup>8</sup>

The pattern method of presentation followed in the research

<sup>8</sup> In so far as appropriate, the general and the detailed headings named above were also utilized in the tabular review of non-correlational studies presented in a separate monograph, *Measures* being the only one of the headings given which did not apply. Since experimental groups were paired with control groups in this review, the prescribed items as far as possible were entered in identical form for the paired groups. In spite of the practical identity of the general and the detailed headings for the two types of studies, the distinctive headings applied to a particular table differed according to the type of studies reviewed, those utilized in the non-correlational studies calling for selected findings of critical import and diagnostic significance.

Although the headings utilized in the case of both the correlational and the non-correlational studies are in the main self-explanatory, it should be noted that the information regarding date of investigation as tabulated may refer to the year or the years during which the investigation was carried on or for which data were studied. An explanation of the identical detailed headings utilized in the tabular review of non-correlational studies, which in its general features also applies to the tabular reviews included in this volume, will be found in the separate monograph already referred to (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 1).

calls for the development in an orderly fashion of the discussion of any topic in accordance with a method of treatment which is generally applicable to the various discussions of that same general type, such modifications in statement being introduced in each case as fit the requirements of that particular treatment. This method of presentation is consistently followed throughout the text, but is most easily identified in the abridged review of non-correlational studies, and in the presentation and interpretation of the correlational results in the various divisions of the research.

The uniform basis of interpretation used in the research applies to the correlational results as presented in the several divisions, and requires that, regardless of the type of coefficient concerned, in classifying the coefficients under consideration as negligible, low, marked, or high, certain arbitrary limits shall be consistently observed. The detailed schedule followed in interpreting the correlational results throughout the research is given below:<sup>9</sup>

NEGATIVE		POSITIVE
Range of Coefficients*	Classification of Coefficients	Range of Coefficients*
	<i>Negligible</i>	
- .01 to - .10	Practically negligible	.00 to + .09
	<i>Low</i>	
- .11 to - .20	Very low	+ .10 to + .19
- .21 to - .30	Fairly low	+ .20 to + .29
- .31 to - .40	Rather low	+ .30 to + .39
	<i>Marked</i>	
- .41 to - .50	Somewhat marked	+ .40 to + .49
	Well marked	+ .50 to + .59
	Decidedly marked	+ .60 to + .69
	<i>High</i>	
	Fairly high	+ .70 to + .79
	Very high	+ .80 to + .89
	Extremely high	+ .90 to + .99

\* The limits of the step intervals for the ranges beginning at .00 or above should be interpreted as extending from -.0050 to +.0950, and so on, and for those beginning below .00, as extending from -.0050 to -.1050, and so on.

<sup>9</sup> This schedule is based on the frequency distributions included in an analysis of the individual coefficients tabulated in the three parts of the research, as given in Appendix IV, Sections 1 and 2.

In conclusion, it is important to note that, although by reason of the fundamental character of the classification according to types of evidence the basic unit of organization throughout the research is the measure of intellect employed, the measure of morality employed is of equal importance, since in a study of the relation between morality and intellect no evidence as to the relationship under investigation inheres in measures of morality except as they are associated with measures of intellect.<sup>10</sup> Moreover, it is apparent that types of evidence as to the relation between morality and intellect, viewed from the standpoint of the research as a whole, become in reality types of evidence as to the relation between delinquency and mental inferiority or types of evidence as to the relation between moral character and intelligence from the point of view of the narrower problems considered in the different divisions of the research.

<sup>10</sup> Since the present research is concerned with the mutual relationship of morality and intellect, and since the determination of the nature of the relation between the qualities investigated involves a measurement, direct or indirect, of both qualities, a classification in terms of measures of morality as well as a classification in terms of measures of intellect would seem to be called for. As a matter of fact, however, practical considerations render a general classification in terms of measures of morality inadvisable for several reasons.

In the first place, in the case of studies of the relation between delinquency and mental inferiority a classification in terms of measures of morality is already implicit in part of the data. Thus the one type of evidence which does not conform to the usual method of classification (that is, Reports concerning Delinquency) is actually classified according to the measure of morality employed, while two of the four types of delinquent groups for which data are tabulated (namely, Sex Offenders and Alcoholics) constitute in themselves a classification in terms of measures of morality.

In the second place, in the case of correlational studies of the relation between delinquency and mental inferiority, and even more characteristically in the case of studies of the relation between moral character and intelligence, the measure of moral character is often analogous in type to the measure of intelligence. Thus in the various studies reported it will be observed that ratings in intellectual traits are almost invariably associated with ratings in moral traits, and that intelligence test results are frequently associated with relatively objective measures of character. In these circumstances a classification in terms of measures of morality would parallel to a certain extent the classification in terms of measures of intellect already employed.

In the third place, since measures of intellect are, in general, more readily differentiated and better known than measures of morality, a classification according to measures of intellect is simpler and more intelligible than a classification according to measures of morality.



PART I

REVIEWS AND SYNTHESSES OF STUDIES OF  
THE RELATION BETWEEN MORALITY AND  
INTELLECT BY MANY INVESTIGATORS

PART I A

STUDIES OF THE RELATION BETWEEN  
DELINQUENCY AND MENTAL INFERIORITY



## CHAPTER III

### A BRIEF SURVEY OF STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY<sup>1</sup>

THE principal considerations in the general organization of subject matter in Part IA were the need for orientation in the division of the research concerned with the relation between delinquency and mental inferiority, the necessity for a compact presentation of the numerous studies bearing upon this problem, the desirability of a presentation in separate chapters of the non-correlational and the correlational studies, and the necessity for the eventual synthesis of the two types of studies. Accordingly, the present chapter supplies a brief survey of studies of the relation between delinquency and mental inferiority, whereas the succeeding chapters offer an abridged review of non-correlational studies of the relation between delinquency and mental inferiority, an account of the statistical reduction of the non-correlational studies, a tabular review of correlational studies of the relation between delinquency and mental inferiority, and a synthesis of studies of this relation.

The brief survey offered in the two sections of this chapter includes a description of the studies reviewed in the investigation of the relation between delinquency and mental inferiority, and an analysis of the three primary methods of classification employed in the research as applied to studies in feeble-minded and delinquent groups.

<sup>1</sup>In this research *delinquency* will be used to refer to all types of offenses, however serious their nature, and *delinquent* to refer to the criminal as well as to the minor offender. *Mental inferiority* has been substituted for the preferred term *mental deficiency* because the latter term is too narrowly restricted to include certain important material relevant to the research. *Mental inferiority* will be used principally to refer to mental deficiency or mental deficiency plus borderlinity, but on occasion to backwardness as well.

## SECTION I

A DESCRIPTION OF THE STUDIES REVIEWED IN THE  
INVESTIGATION OF THE RELATION BETWEEN  
DELINQUENCY AND MENTAL INFERIORITY<sup>2</sup>

Since the prevalence of criminality has been a compelling stimulus toward a discovery of its causes, studies of the relation between morality and intellect have been concerned for the most part with a consideration of the relation between delinquency and mental inferiority.

The studies already reported which have reference to this problem are exceedingly numerous. In fact, two bibliographies by Crafts, published as early as 1916, the one on the relations of crime and feeble-mindedness, which excluded articles dealing with juvenile delinquency and sex immorality (24), and the other on feeble-mindedness in relation to juvenile delinquency (26), together listed more than four hundred titles. A year later a third bibliography by the same author, on feeble-mindedness in its social aspects (25), which, however, was not exclusive of those previously published, filled a monograph of seventy-three pages and included 956 titles. The following year appeared Miner's important review and summary of literature relating to deficiency and delinquency (73), which in a bibliography of 228 references cited sixty-two relating to tested delinquents, and in a single table reported results for more than nine thousand individually tested delinquents. In 1925 was published Gault's five-year review of the literature on criminology (37), which listed 139 titles of articles published from 1920 to 1924, inclusive, many of which are pertinent to the present problem. Since that time indexes of the publications of each new year continue to bear witness to an expanding literature in this field.<sup>3</sup>

<sup>2</sup> The studies reviewed in the investigation of the relation between delinquency and mental inferiority include studies published prior to January 1, 1928, and, in addition, the study of the relation between delinquency and mental deficiency published in Appendix I, Section 1, of this volume.

<sup>3</sup> Other reviews and bibliographies which may be consulted with profit include those by Bronner (15), Burt (16), Cady (17), Curti (27), Fernald, Hayes, and Dawley (35), Gruhle (46), Kelley (57), Kohs (60), Lund (67), Mitchell and Ruger (77), New York State Commission of Prisons (80), Pintner (87), Pintner and Paterson (89), Raubenheimer (92), Riebesell (93), Roback (94), Slawson (97), Sutherland (104), Terman (107), Wallin (116), and Williams (122).

This literature is not alone extensive. By reason of the manner of publication and the auspices under which it is published, it is in many instances relatively inaccessible. Furthermore, the better to suit the audience to which it is addressed, it is often non-technical in character. Finally, it is not of uniform quality, but represents contributions of all degrees of excellence from the maiden offerings of "Binet testers" to the matured researches of well-trained investigators.

In the selection of studies of the relation between delinquency and mental inferiority for review in this investigation two main principles were operative. The first principle was to include both non-correlational and correlational studies. Since, as indicated in the preceding chapter, the employment of correlational procedures has been exceptional rather than general in the case of studies in delinquent groups, and since it has proved possible in the present instance to subject to a correlational procedure selected data from the studies which were non-correlational in type, the advisability of following this principle is apparent.

The second principle was to give precedence as source material to existing reviews of the literature. The practical wisdom of this principle is suggested by the nature of the available literature in the field, as already described. However, the incompleteness of these reviews in the case of the non-correlational studies, and their rather general absence in the case of the correlational studies, as well as the desirability of uniformly consulting the original sources in the case of data calling for very detailed entries, led to the inclusion of a large number of original reports of individual investigations.<sup>4</sup>

In view of this representation of both non-correlational and correlational studies in the types of studies reviewed, the references on the relation between delinquency and mental inferiority utilized in this investigation have been culled from a great variety

<sup>4</sup>In view of certain considerations noted in the text, and in view of the fact that duplications or more or less complete accounts of many of these are to be found in the periodical literature, the following pamphlet publications were uniformly excluded as source material: (1) annual reports and special publications of courts and of penal and corrective institutions, (2) reports of mental hygiene surveys, and (3) reports of the decennial enumerations of prisoners and juvenile delinquents prior to the enumeration made in connection with the 1920 census of the United States. Reviews and abstracts of state and institution reports appearing in the *Journal of Delinquency* were likewise excluded.

of sources. These include the reviews and bibliographies already cited, reports of experimental investigations involving measures of delinquency and mental inferiority, general or theoretical discussions in the fields of criminology and mental defect, and the necessary handbooks of census data, educational statistics, and statistical method. As a result, the reviews of studies of the relation between delinquency and mental inferiority presented in the investigation presumably provide an adequate historical survey of the subject.<sup>5</sup>

## SECTION 2

### AN ANALYSIS OF THE THREE PRIMARY METHODS OF CLASSIFICATION EMPLOYED IN THE RESEARCH AS APPLIED TO STUDIES IN FEEBLE-MINDED AND DELINQUENT GROUPS

An analysis of the three primary methods of classification employed in the research as applied to studies in feeble-minded and delinquent groups, that is, studies of the relation between delinquency and mental inferiority, is given below.<sup>6</sup>

The first primary method of classification is the classification according to types of evidence. The major and minor types of evidence as to the relation between morality and intellect contributed by studies of the relation between delinquency and mental inferiority are as follows:

REPORTS CONCERNING DELINQUENCY.

ESTIMATES OF MENTAL DEFICIENCY.

REPORTS OF EDUCATIONAL STATUS: Reports of Illiteracy, Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement.

<sup>5</sup> References utilized in studies of the relation between delinquency and mental inferiority are listed in Appendix V, Section 1. In addition to their restricted use in this presentation, the references given constitute a working bibliography in this field.

<sup>6</sup> It should be stated that this analysis includes both non-correlational and correlational studies of the relation between delinquency and mental inferiority, and that the same types of evidence, and likewise the same types of groups and countries, are represented in the tabular and the abridged reviews of the non-correlational studies in the case of feeble-minded, non-feeble-minded, and delinquent groups, and with the exception of one type of group (Patrolmen) and one country (Australia) in the case of non-delinquent groups.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence,<sup>7</sup> Results of Army Mental Tests, Results of Tests of Non-Verbal Concrete Intelligence, Results of Tests of Mechanical Intelligence.

The second primary method of classification is the classification according to types of groups. The following types of groups are represented in the abridged or tabular reviews of these studies:

FEEBLE-MINDED GROUPS: General Feeble-Minded Population, Feeble-Minded Persons at Large in Community, Feeble-Minded Persons in Institutions, Feeble-Minded Children in Public Schools.

NON-FEEBLE-MINDED GROUPS: General Population, Children of Delinquency Age, School Children.

DELINQUENT GROUPS: Adult Criminals, Juvenile Delinquents, Sex Offenders, Alcoholics.

NON-DELINQUENT GROUPS: General Population, Persons Signing Marriage Registers, Army Recruits, Adult Defectives, Working Girls, School Children.

The third primary method of classification is the classification according to countries. The following countries are represented in the abridged or tabular reviews of these studies:

FEEBLE-MINDED AND NON-FEEBLE-MINDED GROUPS: No Specific Country, United States, Great Britain, Belgium.

DELINQUENT GROUPS: United States and Canada, United States, Canada, Philippine Islands, Porto Rico, Great Britain and Ireland, Great Britain, France, Sweden, Central Europe, Germany, Australia.

NON-DELINQUENT GROUPS: United States, Canada, Philippine Islands, Porto Rico, Great Britain and Ireland, Great Britain, France, Sweden, Central Europe, Germany.

<sup>7</sup> Because of the differing emphases in the earlier and the later periods of the use of these tests, in the abridged review of non-correlational studies of the relation between delinquency and mental inferiority and in the presentation and interpretation of the coefficients of colligation obtained by the statistical reduction of the non-correlational studies representing Results of Tests of Verbal Abstract Intelligence, this type of evidence is subdivided into Earlier and Later Results.

## CHAPTER IV

### AN ABRIDGED REVIEW OF NON-CORRELATIONAL STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY

THE present abridged review of non-correlational studies of the relation between delinquency and mental inferiority is based on a tabular review of non-correlational studies of this relationship presented in a separate monograph, entitled *A Comparative Study of Delinquents and Non-Delinquents*.<sup>1</sup> The purpose of the abridged review is to summarize the data included in the tabular review which are of greatest importance from the standpoint of the relation between delinquency and mental inferiority, and hence of the relation between morality and intellect.

The tabular review of non-correlational studies referred to above presents important evidence as to the relation between delinquency and mental inferiority for more than eleven thousand feeble-minded persons and approximately three hundred thousand delinquents,<sup>2</sup> utilized in connection with a great body of comparative data representing even larger numbers in non-feeble-minded and non-delinquent groups.<sup>3</sup>

<sup>1</sup>For information regarding this monograph, address Clara Chassell Cooper, in care of the Bureau of Publications, Teachers College, Columbia University, New York City.

<sup>2</sup>Duplications in the subjects are presumably excluded in these figures if reported by the same authority. It is of interest to note that the number of feeble-minded subjects represented in the abridged review (11,052) remains unchanged in comparison with the tabular review, but that the number of delinquent subjects is reduced by several thousand cases (from 299,806 to 296,281).

<sup>3</sup>Further information regarding the scope of the tabular review is given in an explanation of the purpose and the plan of the comparative study of delinquents and non-delinquents, and in detailed rules governing the inclusion of data in the comparative study, which will be found in the monograph referred to above. A final survey of the findings and suggested practical uses of the comparative study of delinquents and non-delinquents are also included in this monograph. (Cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chap. 1, Appendix, Section 2, and Chap. 6.)



The data considered in this abridged review are confined to the most significant percentages tabulated in the original review. Generally speaking, the information represented by these crucial percentages<sup>4</sup> in the case of feeble-minded and non-feeble-minded groups may be taken to signify the percentage presumably characterized by marked moral inferiority; and in the case of delinquent and non-delinquent groups, the percentage presumably characterized by mental deficiency, and likewise the percentage presumably characterized either by mental deficiency or by borderline intelligence, one or both of these percentages being included as available. In place of this information for delinquent and non-delinquent groups, however, the percentage presumably characterized by mental backwardness, or, again, the percentage presumably characterized by mental superiority (interpreted from the standpoint of the relation between delinquency and mental inferiority), may be utilized in place of one or both of these percentages.

The order of presentation used in this chapter follows the order of presentation for the monograph, the four sections of this chapter corresponding to the four chapters containing the detailed tables of the tabular review. Moreover, although many topic headings are omitted in the abridged review, the headings used in this review are identical with those used in the four chapters presenting the tabular review, thus making cross-reference both practical and convenient.

The following major and minor types of evidence as to the relation between delinquency and mental inferiority are represented by the data considered:

REPORTS CONCERNING DELINQUENCY.

ESTIMATES OF MENTAL DEFICIENCY.

<sup>4</sup> Abbreviated tabulations of crucial percentages derived from the tabular review of non-correlational studies, constituting the data considered in the present abridged review of these studies, are presented in the monograph referred to above (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 4).

Prior to a consideration of these percentages, it is important to note that the term *crucial percentages*, as applied to the most significant percentages tabulated in the original review, is used for want of a better term, and though intended to connote the critical nature of these percentages from a diagnostic standpoint, should not be construed as indicating a finality of judgment with reference to the boundaries chosen in a particular case. In fact, the boundaries utilized for certain types of data lay claim to no theoretical justification, but rather were dependent upon the data available.

REPORTS OF EDUCATIONAL STATUS: Reports of Illiteracy, Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Army Mental Tests, Results of Tests of Non-Verbal Concrete Intelligence, Results of Tests of Mechanical Intelligence.

In the monograph referred to the various types of evidence enumerated above were assigned to fifteen tables, which together constitute the tabular review of non-correlational studies of the relation between delinquency and mental inferiority. The essential information included in these tables will be summarized in the appropriate connections in the succeeding sections. The general classification of the data to be presented by major types of evidence and the comparative method of treatment followed in the monograph and preserved in this chapter are indicated by the headings of these sections, which are as follows: (1) reports concerning delinquency in paired feeble-minded and non-feeble-minded groups; (2) estimates of mental deficiency in paired delinquent and non-delinquent groups; (3) reports of educational status in paired delinquent and non-delinquent groups; and (4) results of intelligence tests in paired delinquent and non-delinquent groups.<sup>5</sup>

<sup>5</sup> As a means of clarifying the information given in the succeeding sections, the following general explanations may be offered:

(1) The crucial percentages which serve as the basis of the analysis for each type of evidence are arranged for convenient reference in an abbreviated tabulation under the title of the corresponding detailed table in the monograph already referred to (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 4). The particular authorities reporting the data utilized for feeble-minded and delinquent groups may be ascertained by reference to Table I in Chapter VI, in which coefficients of colligation between measures of delinquency and mental inferiority obtained by the statistical reduction of the non-correlational studies are presented.

(2) Since the problem under consideration throughout this chapter is the relation between delinquency and mental inferiority, in the abbreviated tabulations of crucial percentages referred to above a higher result for feeble-minded groups than for non-feeble-minded groups or for delinquent groups than for non-delinquent groups was counted as an instance of positive comparison and a lower result as an instance of negative comparison, except in those instances in which the data tabulated represented the percentage presumably characterized by mental superiority, in which cases the usual basis of interpretation was reversed; at the same time an identical result for the paired groups was counted as an instance of neutral comparison.

(3) The number of feeble-minded and non-feeble-minded or delinquent and non-delinquent groups given in the brief summary for each type of

SECTION I<sup>6</sup>

## REPORTS CONCERNING DELINQUENCY IN PAIRED FEEBLE-MINDED AND NON-FEEBLE-MINDED GROUPS

The first major type of evidence as to the relation between delinquency and mental inferiority consists in Reports concerning Delinquency. In the tabular review of non-correlational studies this type of evidence is presented for paired feeble-minded and non-feeble-minded groups.

The significance of Reports concerning Delinquency lies in the fact that it approaches the problem of the relation between delinquency and mental inferiority from the standpoint of the extent of moral inferiority among the mentally inferior in comparison

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evidence corresponds to the number of groups represented by crucial percentages in the appropriate abbreviated tabulation. The total number of cases for feeble-minded or for delinquent groups was also obtained from this abbreviated tabulation. Hence the figures given do not exclude duplications in the groups nor in the subjects, and at the same time include the number of cases arbitrarily supplied in accordance with a routine procedure for the groups for which the number of cases was not provided in the original source. The instances in question are indicated in the abbreviated tabulations by brackets enclosing the number of cases supplied.

(4) The correlational results reported in these brief summaries are generally the limits of the middle fifty per cent of the coefficients calculated for the type of evidence in question in the course of the statistical reduction of the non-correlational studies, weighted by the number of cases for their respective feeble-minded or delinquent groups. If the number of coefficients thus obtained was ten or more, however, the limits of the middle eighty per cent of the coefficients, similarly weighted, are also reported, and if the number was four or less, the weighted mean only is reported, except in the one case in which but one coefficient was available. In addition to the usual percentile points, the lowest coefficient obtained is also reported for the two types of evidence which are characterized by the highest results.

The individual coefficients represented in the results thus summarized, with the pooled percentages from which they were derived, will be presented in Table I in Chapter VI, already referred to.

(5) The effect of the various factors enumerated in the evaluation of the findings for each type of evidence and the particular studies involved will be indicated in the interpretation of the table presenting the coefficients obtained by the statistical reduction of the non-correlational studies, referred to above.

<sup>6</sup>This section corresponds to Chapter 2 of the monograph presenting the tabular review of non-correlational studies of the relation between delinquency and mental inferiority, entitled *A Comparative Study of Delinquents and Non-Delinquents*.

with the mentally normal, whereas the other types of evidence included in the tabular review approach this problem from the standpoint of the extent of mental inferiority among the morally inferior in comparison with the morally normal. This type of evidence is of particular interest, however, not alone because it represents a converse method of approach to the problem under consideration, but also because it provides the only data of this character which are incorporated in the correlational results of the research.

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below:

Table 1. A Comparison between Paired Feeble-Minded and Non-Feeble-Minded Groups as to Delinquency

The information represented by the crucial percentages for feeble-minded and non-feeble-minded groups is the percentage delinquent. This percentage may be regarded as a rough measure of the percentage characterized by marked moral inferiority in the groups represented.

The crucial percentages described above were derived from data for feeble-minded groups reported by thirteen different authorities, and from similar data for comparable non-feeble-minded groups provided by these same authorities or supplied from other sources. The types of groups and the countries represented by these crucial percentages are given below:

FEEBLE-MINDED	NON-FEEBLE-MINDED
General Feeble-Minded Population	General Population
No Specific Country	No Specific Country
United States	United States
Great Britain	Great Britain
Feeble-Minded Persons at Large in Community	General Population, School Children, or Children of Delinquency Age
United States	United States
Feeble-Minded Persons in Institutions	General Population or School Children
United States	United States
Great Britain	Great Britain

Feeble-Minded Children in Pub- lic Schools United States Belgium	School Children or Children of Delinquency Age United States Belgium
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A detailed analysis of the crucial percentages for paired feeble-minded and non-feeble-minded groups which takes into account the twenty-four instances of comparison yields the following results:

#### REPORTS CONCERNING DELINQUENCY

Percentage Delinquent: 22 instances of positive comparison, 2 instances of negative comparison.

In the light of this analysis, the comparison between paired feeble-minded and non-feeble-minded groups as to delinquency may be interpreted as follows:

Feeble-minded groups almost without exception show a higher percentage delinquent than comparable non-feeble-minded groups.

From the standpoint of the problem under investigation, reports concerning delinquency in paired feeble-minded and non-feeble-minded groups may be summarized briefly as follows:

A comparison between paired feeble-minded and non-feeble-minded groups as to delinquency affords practically consistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage delinquent for 24 feeble-minded groups totalling 19,808 cases and an equal number of paired non-feeble-minded groups. The degree of relationship found in the case of Reports concerning Delinquency is somewhat variable, but tends to be marked. In correlational terms it may be represented by a coefficient of colligation commonly lying between .50 and .54.

Lastly, it is important to note that in evaluating the findings for Reports concerning Delinquency a consideration of the probable effect of various factors, including the use of variant standards of delinquency, the tendency of the more intelligent offender to escape detection as delinquent, the close supervision or artificial restraint of the feeble-minded, and a difference in the ages of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general considerably too high to represent the actual situation with respect to delinquency in feeble-minded and non-feeble-minded groups.

SECTION 2<sup>7</sup>ESTIMATES OF MENTAL DEFICIENCY IN PAIRED  
DELINQUENT AND NON-DELINQUENT GROUPS

The second major type of evidence as to the relation between delinquency and mental inferiority consists in Estimates of Mental Deficiency. In the tabular review of non-correlational studies this type of evidence is presented first for individual delinquent groups, secondly for individual non-delinquent groups, and lastly for paired types of delinquent and non-delinquent groups.

The significance of Estimates of Mental Deficiency lies in the fact that, although this type of evidence is the least subjective of all the types considered in the research, such estimates represent an attempt to diagnose mental deficiency in terms of the personality as a whole to an extent that more objective methods rarely essay.

The data to be considered are confined to the crucial percentages for unpaired groups contained in the detailed tables presented in the monograph reporting the comparative study under the titles given below:

Table 2. Estimates of Mental Deficiency among Delinquents

Table 3. Estimates of Mental Deficiency among Non-Delinquents

The information represented by the crucial percentages for delinquent groups is the percentage mentally deficient. In view of the exceptions or qualifications noted in the corresponding detailed table, however, the percentage tabulated should be regarded in some cases as equivalent to the percentage characterized by mental deficiency, but in other cases as more nearly equivalent to the percentage characterized either by mental deficiency or by borderline intelligence, in the groups represented.

The information represented by the crucial percentages for non-delinquent groups is also the percentage mentally deficient. More narrowly interpreted, however, the percentage tabulated may be regarded as generally equivalent to the percentage characterized by mental deficiency in the groups represented if the estimate refers to the social isolation group, and as generally equivalent to

<sup>7</sup>This section corresponds to Chapter 3 of the monograph presenting the tabular review of non-correlational studies of the relation between delinquency and mental inferiority, entitled *A Comparative Study of Delinquents and Non-Delinquents*.

the percentage characterized by borderline intelligence in these groups if it refers to the social assistance group.<sup>8</sup>

Since estimates of mental deficiency among delinquents must be considered in connection with estimates of mental deficiency among non-delinquents to permit the formulation of an answer to the question concerning the nature of the relation between delinquency and mental inferiority, the crucial percentages for unpaired groups contained in the two tables named above, representing 115 estimates for delinquent groups and 42 estimates for non-delinquent groups, were combined in the table presented in the monograph reporting the comparative study<sup>9</sup> under the title given below:

Table 4. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Mental Deficiency

In this table pooled percentages<sup>10</sup> take the place of the original percentages, and types of groups rather than individual groups are paired.

Derived from the tables indicated, the information represented by the pooled percentages for delinquent and non-delinquent groups is likewise the percentage mentally deficient. Moreover, these pooled percentages have the same significance that they would have if they appeared in the corresponding columns of the appropriate basic tables, with this exception that a consensus of estimates rather than a single estimate is typically represented, and with the provision in the case of the pooled results for non-

<sup>8</sup> According to the definitions given by Miner, the social isolation group is the group "which, for moral and eugenic reasons, society is justified in isolating for life or an indefinite period"; and the social assistance group is the group "which needs special simple industrial training in order to get along with social assistance without isolation," these deficient being able to "be cared for in their home towns by special schools, public guardians, and after-care committees" (cf. 73, pp. 47-48).

<sup>9</sup> Detailed rules for combining data derived from the tabular review of non-correlational studies are given in the monograph referred to above (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 5).

<sup>10</sup> The term *pooled percentage* normally refers to weighted mean percentages calculated for each type of group and country and for certain minor classifications of the data from the crucial percentages for feeble-minded and non-feeble-minded and for delinquent and non-delinquent groups; for the sake of convenience, however, the term is also applied to a single percentage representing any one of the divisions of the data specified above, provided no other percentage was tabulated in that case.

delinquent groups of separate columns for the percentages representing the social isolation and the social assistance groups, and also for the combined percentage for the two grades of feeble-mindedness thus differentiated.

The pooled percentages described above combine data for types of delinquent groups originally reported by twenty-five different authorities, and similar data for comparable types of non-delinquent groups compiled by Miner from various sources. The types of groups and the countries represented by these pooled percentages are given below :

DELINQUENT	NON-DELINQUENT
Adult Criminals	General Population or School Children
United States	United States
Great Britain and Ireland	Great Britain
Germany	Central Europe
Juvenile Delinquents	School Children
United States	United States
Great Britain	Great Britain and Ireland
Sweden	Sweden
Central Europe	Central Europe
Sex Offenders	General Population or School Children
United States	United States
Great Britain	Great Britain
Germany	Central Europe
Alcoholics	General Population
Great Britain	Great Britain

A detailed analysis of the pooled percentages for paired delinquent and non-delinquent groups which takes into account the eleven instances of comparison yields the following results:

#### ESTIMATES OF MENTAL DEFICIENCY

Percentage Mentally Deficient: 11 instances of positive comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to mental deficiency may be interpreted as follows:

Types of delinquent groups without exception show a higher percentage mentally deficient than comparable types of non-delinquent groups.



From the standpoint of the problem under investigation, estimates of mental deficiency in paired delinquent and non-delinquent groups may be summarized briefly as follows:

A comparison between paired delinquent and non-delinquent groups as to mental deficiency affords wholly consistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage mentally deficient for 115 delinquent groups totalling 163,744 cases and 42 non-delinquent groups, paired as appropriate by types of groups. The degree of relationship found in the case of Estimates of Mental Deficiency is somewhat variable, but tends to be high. In correlational terms it may be represented by a coefficient of colligation ranging as low as .56, but rarely falling below .73 or above .79, and commonly lying between .75 and .78.

Lastly, it is important to note that in evaluating the findings for Estimates of Mental Deficiency a consideration of the probable effect of various factors, including the use of varying standards of mental deficiency and the marked subjectivity of the data, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general very much too high to represent the actual situation with respect to mental deficiency in delinquent and non-delinquent groups. It is therefore possible that the lowest figure given above should be regarded as the most satisfactory indication of the degree of relationship in question.

### SECTION 3<sup>11</sup>

#### REPORTS OF EDUCATIONAL STATUS IN PAIRED DELINQUENT AND NON-DELINQUENT GROUPS

The third major type of evidence as to the relation between delinquency and mental inferiority consists in Reports of Educational Status. The constituent minor types of evidence, comprising the types of evidence for which data are summarized, are Reports of Illiteracy, Reports of Amount of Schooling, Reports of School Progress, and Reports of Educational Achievement. In

<sup>11</sup> This section corresponds to Chapter 4 of the monograph presenting a tabular review of non-correlational studies of the relation between delinquency and mental inferiority, entitled *A Comparative Study of Delinquents and Non-Delinquents*.

the tabular review of non-correlational studies these types of evidence are presented for paired delinquent and non-delinquent groups.

The significance of Reports of Educational Status lies in the fact that the four constituent minor types of evidence represent the more important types of information afforded by contact with educational agencies, and may be taken as so many approximate methods of measuring intelligence.

The present detailed comparison between paired delinquent and non-delinquent groups as to educational status includes a condensed account of the findings for each of the constituent minor types of evidence.

### *Reports of Illiteracy*

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below :

Table 5. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Illiteracy

The information represented by the crucial percentages for delinquent and non-delinquent groups is the percentage illiterate. This percentage may be regarded as a rough measure of the percentage characterized either by mental deficiency or by borderline intelligence in the groups represented.

The crucial percentages described above were derived from data for delinquent groups reported by twenty-two different authorities, and from similar data for comparable non-delinquent groups supplied from census reports and from other sources. The types of groups and the countries represented by these crucial percentages are given below :

DELINQUENT	NON-DELINQUENT
Adult Criminals	General Population, Persons Signing Marriage Registers, or Army Recruits
United States and Canada	United States
United States	United States
Philippine Islands	Philippine Islands
Great Britain	Great Britain
France	France

Juvenile Delinquents	General Population, Persons Signing Marriage Registers, or School Children
United States	United States
Porto Rico	Porto Rico
Great Britain	Great Britain
Germany	Germany
Sex Offenders	General Population
United States	United States
Alcoholics	Persons Signing Marriage Reg- isters
Great Britain	Great Britain

A detailed analysis of the crucial percentages for paired delinquent and non-delinquent groups which takes into account the forty-four instances of comparison yields the following results:

#### REPORTS OF ILLITERACY

Percentage Illiterate: 36 instances of positive comparison, 8 instances of negative comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to illiteracy may be interpreted as follows:

Delinquent groups with comparatively few exceptions show a higher percentage illiterate than comparable non-delinquent groups.

From the standpoint of the problem under investigation, reports of illiteracy for paired delinquent and non-delinquent groups may be summarized briefly as follows:

A comparison between paired delinquent and non-delinquent groups as to illiteracy affords fairly consistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage illiterate for 44 delinquent groups totalling 159,286 cases and an equal number of paired non-delinquent groups. The degree of relationship found in the case of Reports of Illiteracy is decidedly variable, but tends to be low. In correlational terms it may be represented by a coefficient of colligation rarely falling below  $-.09$  or above  $+.24$ , and commonly lying between  $-.07$  and  $+.22$ .

Lastly, it is important to note that in evaluating the findings for Reports of Illiteracy a consideration of the probable effect of various factors, including the use of variant standards of illiteracy, the use of different methods of obtaining information

regarding illiteracy, the opportunity frequently afforded delinquents for formal instruction after detention, a geographical disparity in the data for the paired groups, a difference in the ages of the paired groups, a serious discrepancy in the periods covered by the data for the paired groups, and an unrepresentative intelligence distribution for one of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general a fairly accurate representation of the situation with respect to illiteracy in delinquent and non-delinquent groups.

### *Reports of Amount of Schooling*

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below:

Table 6. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Amount of Schooling

The information represented by the crucial percentages for delinquent and non-delinquent groups is the percentage reaching Grade I or below, Grade II or below, Grade III or below, and Grade VI or below. The percentage reaching Grade I or below may be regarded as a rough measure of the percentage characterized by mental deficiency, and the percentage reaching Grade II or below as a rough measure of the percentage characterized either by mental deficiency or by borderline intelligence, in the groups represented, the percentages reaching Grade III or below or Grade VI or below being included among the most significant percentages only in the case of the paired groups for which at least one of the preferred percentages was not available. The above rule, however, was modified in the case of Juvenile Delinquents, United States, to permit the substitution of the percentage reaching Grade VI or below for all groups represented by one or both of the preferred percentages and its supplementary use in the remaining instance, since the percentage for the higher grade was found to afford a more satisfactory comparison on account of the relative immaturity of the non-delinquent groups.

The crucial percentages described above were derived from data for delinquent groups reported by twenty-five different authorities,

and from similar data for comparable non-delinquent groups provided by these same authorities or supplied from other sources. The types of groups and the countries represented by these crucial percentages are given below :

DELINQUENT	NON-DELINQUENT
Adult Criminals	Army Recruits
United States	United States
Juvenile Delinquents	Army Recruits or School Children
United States	United States
Germany	Germany
Sex Offenders	Working Girls
United States	United States

A detailed analysis of the crucial percentages for paired delinquent and non-delinquent groups which takes into account the forty-seven instances of comparison yields the following results :

#### REPORTS OF AMOUNT OF SCHOOLING

##### Percentage Reaching Grade

I or Below: 6 instances of positive comparison, 3 instances of negative comparison.

II or Below: 10 instances of positive comparison, 4 instances of negative comparison.

III or Below: 2 instances of positive comparison.

VI or Below: 20 instances of positive comparison, 2 instances of negative comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to amount of schooling may be interpreted as follows:

Delinquent groups may show either a higher or a lower percentage reaching the lower grades in school than comparable non-delinquent groups, but the results of the comparison are on the whole decidedly favorable to the non-delinquent groups.

From the standpoint of the problem under investigation, reports of amount of schooling in paired delinquent and non-delinquent groups may be summarized briefly as follows:

A comparison between paired delinquent and non-delinquent groups as to amount of schooling affords fairly consistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage reaching the lower grades in school for 37 delinquent groups total-

ling 30,169 cases and an equal number of paired non-delinquent groups. The degree of relationship found in the case of Reports of Amount of Schooling is relatively constant, and tends to be low. In correlational terms it may be represented by a coefficient of colligation commonly lying between .12 and .19.

Lastly, it is important to note that in evaluating the findings for Reports of Amount of Schooling a consideration of the probable effect of various factors, including the lock-step system of promotion, a geographical disparity in the data for the paired groups, an unrepresentative intelligence distribution for one of the paired groups, a difference in the racial composition of the paired groups, and a difference in the ages of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general considerably too low to represent the actual situation with respect to amount of schooling in delinquent and non-delinquent groups.

### *Reports of School Progress*

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below:

Table 7. A Comparison between Paired Delinquent and Non-Delinquent Groups as to School Progress

This table has two major divisions, which serve to differentiate the various reports according to their treatment of the relative ages of the groups compared. These major divisions are designated as follows:

- A. Data Which Take into Consideration the Difference in the Ages of the Paired Groups.
- B. Data Which Disregard the Difference in the Ages of the Paired Groups.

The information represented by the crucial percentages for delinquent and non-delinquent groups in the first major division of this table is the mean percentage retarded at each life age, and in the second major division, the percentage retarded 5 years or more, 4 years or more, and total. In the first major division of the table the mean percentage retarded may be regarded as a very

rough measure of the percentage characterized by mental inferiority in the groups represented; whereas in the second major division the percentage retarded 5 years or more may be regarded as a rough measure of the percentage characterized by mental deficiency, and the percentage retarded 4 years or more as a rough measure of the percentage characterized either by mental deficiency or by borderline intelligence, in the groups represented, the total percentage retarded being included among the most significant percentages only in the case of those groups for which at least one of the preferred percentages was not available.

The crucial percentages described above were derived from data for delinquent groups reported by eighteen different authorities, and from similar data for comparable non-delinquent groups provided by these same authorities or supplied from other sources. The types of groups and the countries represented by these crucial percentages are given below:

DELINQUENT	NON-DELINQUENT
Adult Criminals	Working Girls
United States	United States
Juvenile Delinquents	School Children
United States	United States
Germany	Germany
Sex Offenders	Working Girls
United States	United States

A detailed analysis of the crucial percentages for paired delinquent and non-delinquent groups which takes into account the forty-one instances of comparison yields the following results:

#### REPORTS OF SCHOOL PROGRESS

A. Data Which Take into Consideration the Difference in the Ages of the Paired Groups

Mean Percentage Retarded at Each Life Age: 3 instances of positive comparison.

B. Data Which Disregard the Difference in the Ages of the Paired Groups

Percentage Retarded

5 Years or More: 14 instances of positive comparison, 1 instance of neutral comparison, 1 instance of negative comparison.

4 Years or More: 15 instances of positive comparison, 1 instance of negative comparison.

Total: 5 instances of positive comparison, 1 instance of negative comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to school progress may be interpreted as follows:

(1) If the difference in the ages of the paired groups is taken into consideration:

Delinquent groups consistently show a higher mean percentage retarded at each life age than comparable non-delinquent groups.

(2) If the difference in the ages of the paired groups is disregarded:

Delinquent groups almost without exception show a higher percentage retarded than comparable non-delinquent groups, whatever the degree of retardation represented in the comparison.

From the standpoint of the problem under investigation, reports of school progress in paired delinquent and non-delinquent groups may be summarized briefly as follows:

A comparison between paired delinquent and non-delinquent groups as to school progress affords practically consistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage retarded for 25 delinquent groups totalling 5,607 cases and an equal number of paired non-delinquent groups. The degree of relationship found in the case of Reports of School Progress is somewhat variable, but tends to be marked. In correlational terms it may be represented by a coefficient of colligation commonly lying between .46 and .52.

Lastly, it is important to note that in evaluating the findings for Reports of School Progress a consideration of the probable effect of various factors, including the lock-step system of promotion, the difference in the ages of the paired groups, and a difference in the racial composition of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general a fairly accurate representation of the actual situation with respect to school progress in delinquent and non-delinquent groups.

#### *Reports of Educational Achievement*

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below:



Table 8. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Educational Achievement

The information represented by the crucial percentages for delinquent and non-delinquent groups is the percentage testing below 85. This percentage may be regarded as a rough measure of the percentage characterized by mental backwardness in the groups represented.

The crucial percentages described above were derived from data for a delinquent group reported by a single authority, and from similar data for a comparable non-delinquent group provided by this same authority.<sup>12</sup> The types of groups and the country represented by these crucial percentages are given below :

DELINQUENT	NON-DELINQUENT
Juvenile Delinquents	School Children
Great Britain	Great Britain

An analysis of the crucial percentages for paired delinquent and non-delinquent groups similar to the analyses for the other types of evidence which takes into account the one instance of comparison yields the following result :

#### REPORTS OF EDUCATIONAL ACHIEVEMENT

Test Result Expressed as Quotient or Ratio

Percentage Testing below 85: 1 instance of positive comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to educational achievement may be interpreted as follows :

Delinquent groups may be expected to show a higher percentage testing below a low educational ratio than comparable non-delinquent groups.

From the standpoint of the problem under investigation, reports of educational achievement in paired delinquent and non-delinquent groups may be summarized briefly as follows :

<sup>12</sup> Although the crucial percentages for Reports of Educational Achievement represent one study only, the paucity of the data considered is offset in considerable measure by its high quality, since the data in question are among the most satisfactory presented in the entire research, having been taken from an investigation by Burt which was pursued in a most painstaking manner over a long period, and was characterized by unusual care in the selection of comparative data to the end that age, social status, and environmental and educational opportunity might be equalized for the experimental and the control groups.

A comparison between paired delinquent and non-delinquent groups as to educational achievement affords significant evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage testing below a low educational ratio for 1 delinquent group numbering 197 cases and a single paired non-delinquent group. The degree of relationship found in the case of Reports of Educational Achievement is apparently marked. In correlational terms it may be represented by a coefficient of colligation approximating .48.

Lastly, it is important to note that in evaluating the findings for Reports of Educational Achievement a consideration of the applicability of certain factors as possibly affecting the degree of relationship found discloses that it does not appear to be necessary to qualify the findings of the present data by reference to the probable effect of any such factors, and leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general a fairly accurate representation of the situation with respect to educational achievement in delinquent and non-delinquent groups. At the same time, it should be recognized that the small amount of data represented makes it necessary to regard this finding as tentative only.

#### SECTION 4<sup>13</sup>

##### RESULTS OF INTELLIGENCE TESTS IN PAIRED DELINQUENT AND NON-DELINQUENT GROUPS

The fourth major type of evidence as to the relation between delinquency and mental inferiority consists in Results of Intelligence Tests. The constituent minor types of evidence, comprising the types of evidence for which data are summarized, are Results of Tests of Verbal Abstract Intelligence, Results of Army Mental Tests, Results of Tests of Non-Verbal Concrete Intelligence, and Results of Tests of Mechanical Intelligence. In the tabular review of non-correlational studies these types of evidence are presented for paired delinquent and non-delinquent groups, except that in the case of Results of Tests of Verbal Abstract Intelligence

<sup>13</sup> This section corresponds to Chapter 5 of the monograph presenting the tabular review of non-correlational studies of the relation between delinquency and mental inferiority, entitled *A Comparative Study of Delinquents and Non-Delinquents*.

the earlier results are presented first for individual delinquent groups, secondly for individual non-delinquent groups, and lastly for paired types of delinquent and non-delinquent groups.

The significance of Results of Intelligence Tests lies not only in the fact that it is the most objective type of evidence considered in the research, but also in the fact that the four constituent minor types of evidence represent as many different methods of measuring intelligence.

The present detailed comparison between paired delinquent and non-delinquent groups as to intellectual status includes a condensed account of the findings for each of the constituent minor types of evidence.

### *Results of Tests of Verbal Abstract Intelligence*

Because of the differing emphases in the earlier and the later uses of the tests, the present type of evidence will be subdivided into Earlier and Later Results of Tests of Verbal Abstract Intelligence.

#### Earlier Results of Tests of Verbal Abstract Intelligence

The period corresponding to Earlier Results of Tests of Verbal Abstract Intelligence may be defined as the period beginning with the publication of the earliest Binet test results for delinquents, apparently in two articles by Goddard and Hill which appeared in 1911 (43) and (44), and ending with the publication of the outstanding reinterpretation of such results by Miner in 1918 (73). The major emphasis in this stage of the use of tests of verbal abstract intelligence may be described briefly as consisting in an investigation of the prevalence of intellectual deficiency<sup>14</sup> among delinquents, frequently unaccompanied by a comparison with the prevalence of intellectual deficiency among non-delinquents, although separate studies of the prevalence of intellectual deficiency among non-delinquents were being undertaken concurrently by the same or other investigators.

The data to be considered are confined to the crucial percentages for unpaired groups contained in the detailed tables presented in

<sup>14</sup> Commonly phrased as *feeble-mindedness* or *mental deficiency* in the studies referred to. In the present investigation, following Miner (cf. 73, p. 72), the term *intellectual deficiency* is employed if the results of intelligence tests have been taken into consideration in determining the percentage mentally inferior.

the monograph reporting the comparative study under the titles given below :

Table 9. Test Results regarding Intellectual Deficiency among  
Delinquents

Table 10. Test Results regarding Intellectual Deficiency among  
Non-Delinquents

The information represented by the crucial percentages for delinquent groups is the percentage intellectually deficient. The percentage tabulated may be regarded as generally equivalent to the percentage characterized by mental deficiency in the groups represented if the test result refers to the percentage presumably deficient as reinterpreted by Miner and the percentage feeble-minded as reinterpreted by Wallin, and as generally equivalent to the percentage characterized either by mental deficiency or by borderline intelligence in these groups if the test result refers to the percentage feeble-minded as reported by the original investigator, the percentage presumably deficient or doubtful as reinterpreted by Miner, and the percentage feeble-minded as reinterpreted by Pintner and Paterson.

The information represented by the crucial percentages for non-delinquent groups is also the percentage intellectually deficient. The percentage tabulated may be regarded as generally equivalent to the percentage characterized by mental deficiency in the groups represented if the test result refers to the social isolation group, and as generally equivalent to the percentage characterized by borderline intelligence in these groups if it refers to the social assistance group.<sup>15</sup>

Since test results regarding intellectual deficiency among delinquents must be considered in connection with test results regarding intellectual deficiency among non-delinquents to permit the formulation of an answer to the question concerning the nature of the relation between delinquency and mental inferiority, the crucial percentages for unpaired groups contained in the two tables named above, representing 123 reported or reinterpreted test results for delinquent groups and 15 test results for non-delinquent groups, were combined in the table presented in the monograph

<sup>15</sup> Compare the definitions of the social isolation and the social assistance groups taken from Miner, as given in a similar connection in Section 2 of this chapter.

reporting the comparative study<sup>16</sup> under the title given below:

Table 11. A' Comparison between Paired Delinquent and Non-Delinquent Groups as to Intellectual Deficiency

In this table pooled percentages<sup>17</sup> take the place of the original percentages, and types of groups rather than individual groups are paired.

Derived from the tables indicated, the information represented by the pooled percentages for delinquent and non-delinquent groups is likewise the percentage intellectually deficient. Moreover, these pooled percentages have the same significance that they would have if they appeared in the corresponding columns of the appropriate basic tables, with this exception that a consensus of test results rather than a single test result is typically represented, and with the provision in the case of the pooled results for non-delinquent groups of separate columns for the percentages representing the social isolation and the social assistance groups, and also for the combined percentage for the two grades of feeble-mindedness thus differentiated.

The pooled percentages described above combine data for types of delinquent groups compiled by six different authorities, and similar data for comparable types of non-delinquent groups compiled by Miner from various sources. The types of groups and the country represented by these pooled percentages are given below:

DELINQUENT	NON-DELINQUENT
Adult Criminals	General Population
United States	United States
Juvenile Delinquents	School Children
United States	United States
Sex Offenders	General Population
United States	United States

<sup>16</sup> Detailed rules for combining data derived from the tabular review of non-correlational studies are given in the monograph referred to above (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 5).

<sup>17</sup> The term *pooled percentage* normally refers to weighted mean percentages calculated for each type of group and country and for certain minor classifications of the data from the crucial percentages for feeble-minded and non-feeble-minded and for delinquent and non-delinquent groups; for the sake of convenience, however, the term is also applied to a single percentage representing any one of the divisions of the data specified above, provided no other percentage was tabulated in that case.

A detailed analysis of the pooled percentages for paired delinquent and non-delinquent groups which takes into account the fourteen instances of comparison yields the following results:

EARLIER RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE

Percentage Intellectually Deficient

Report

Original Investigator

Percentage Feeble-Minded: 3 instances of positive comparison.

Reinterpretations

Miner

Percentage Presumably Deficient: 3 instances of positive comparison.

Percentage Presumably Deficient or Doubtful: 3 instances of positive comparison.

Pintner and Paterson

Percentage Feeble-Minded: 2 instances of positive comparison.

Wallin

Percentage Feeble-Minded: 3 instances of positive comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to intellectual deficiency may be interpreted as follows:

Types of delinquent groups without exception show a higher percentage intellectually deficient than comparable types of non-delinquent groups.

From the standpoint of the problem under investigation, earlier results of tests of verbal abstract intelligence for paired groups may be summarized briefly as follows:

A comparison between paired delinquent and non-delinquent groups as to intellectual deficiency affords wholly consistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage intellectually deficient for 52 delinquent groups totalling 13,192 cases and 15 non-delinquent groups, appropriately paired by types of groups. The degree of relationship found in the case of Earlier Results of Tests of Verbal Abstract Intelligence is somewhat variable, but tends to be marked. In correlational terms it may be represented by a coefficient of colligation ranging as low as .50, but rarely falling below .54 or above .76, and commonly lying between .63 and .72.

Lastly, it is important to note that in evaluating the findings for Earlier Results of Tests of Verbal Abstract Intelligence a consideration of the probable effect of various factors, including the use of varying standards of intellectual deficiency and the partial subjectivity of the data, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general very much too high to represent the actual situation with respect to intellectual deficiency in delinquent and non-delinquent groups. It is therefore possible that the lowest figure given above should be regarded as the most satisfactory indication of the degree of relationship in question.

#### Later Results of Tests of Verbal Abstract Intelligence

The period corresponding to Later Results of Tests of Verbal Abstract Intelligence may be defined as the period beginning in 1918 with the appearance of Miner's reinterpretation of test results for delinquents (73), and ending with the appearance of the last test results for delinquents published prior to January 1, 1928.<sup>18</sup> The major emphasis in this stage of the use of tests of verbal abstract intelligence may be described briefly as consisting in an investigation of the intellectual status of groups of delinquents, frequently in comparison with the intellectual status of appropriately paired groups of non-delinquents.

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below :

Table 12. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Verbal Abstract Intelligence

This table has three major divisions, which serve to differentiate the various results according to the method of expressing the test result. These major divisions are designated as follows :

- A. Data with the Test Result Expressed as Mental Age.
- B. Data with the Test Result Expressed as Intelligence Quotient.
- C. Data with the Test Result Expressed as Amount of Overlapping.

The information represented by the crucial percentages for delinquent and non-delinquent groups in the first major division of

<sup>18</sup> This date was selected because it coincides with the date limiting the previously published studies reviewed in the investigation of the relation between delinquency and mental inferiority.

this table is the percentage testing below 8.0 and below 9.0; in the second major division, the percentage testing below 70, below 75, and below 80; and in the third major division, the percentage not reaching 2 percentile, 5 percentile, and 50 percentile. In the first major division of the table the percentage testing below 8.0 may be regarded as a reasonably accurate measure of the percentage characterized by mental deficiency, and the percentage testing below 9.0 as a reasonably accurate measure of the percentage characterized either by mental deficiency or by borderline intelligence, in the groups represented;<sup>19</sup> in the second major division the corresponding percentages are the percentage testing below 70 and the percentage testing below 75, the percentage testing below 80 being included among the most significant percentages only in the case of those groups for which at least one of the preferred percentages was not available; while in the third major division the corresponding percentages are the percentage not reaching 2 percentile and the percentage not reaching 5 percentile, the percentage not reaching 50 percentile being included among the most significant percentages only for the groups for which at least one of the preferred percentages was not available.

The crucial percentages described above were derived from data for delinquent groups reported by thirteen different authorities, and from similar data for comparable non-delinquent groups provided by these same authorities or supplied from other sources. The types of groups and the countries represented by these crucial percentages are given below :

DELINQUENT	NON-DELINQUENT
Adult Criminals	Army Recruits, Adult Defectives, or School Children
United States	United States
Great Britain	Great Britain
Australia	Great Britain
Juvenile Delinquents	Army Recruits or School Children
United States	United States
Canada	Canada or United States
Great Britain	Great Britain
Sex Offenders	School Children
United States	United States

<sup>19</sup> Provided the chronological age attained by the members of a particular group is not less than that at which mental maturity is usually reached.



A detailed analysis of the crucial percentages for paired delinquent and non-delinquent groups which takes into account the thirty-seven instances of comparison yields the following results:

LATER RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE

A. Data with the Test Result Expressed as Mental Age

Percentage Testing

Below 8-0: 3 instances of positive comparison, 3 instances of negative comparison.

Below 9-0: 5 instances of positive comparison, 2 instances of negative comparison.

B. Data with the Test Result Expressed as Intelligence Quotient

Percentage Testing

Below 70: 7 instances of positive comparison, 1 instance of negative comparison.

Below 75: 6 instances of positive comparison.

Below 80: 4 instances of positive comparison, 1 instance of negative comparison.

C. Data with the Test Result Expressed as Amount of Overlapping Percentage Not Reaching

2 Percentile: 1 instance of positive comparison.

5 Percentile: 2 instances of positive comparison.

50 Percentile: 2 instances of positive comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to verbal abstract intelligence may be interpreted as follows:

(1) If the test result is expressed as mental age:

Delinquent groups may show either a higher or a lower percentage testing below certain low mental ages than comparable non-delinquent groups, but the results of the comparison are on the whole clearly favorable to the non-delinquent groups.

(2) If the test result is expressed as intelligence quotient:

Delinquent groups almost without exception show a higher percentage testing below certain low intelligence quotients than comparable non-delinquent groups.

(3) If the test result is expressed as amount of overlapping:

Delinquent groups consistently show a higher percentage not reaching certain low percentiles than comparable non-delinquent groups.

From the standpoint of the problem under investigation, later results of tests of verbal abstract intelligence in paired delinquent and non-delinquent groups may be summarized briefly as follows:

A comparison between paired delinquent and non-delinquent groups as to verbal abstract intelligence affords fairly consistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage testing below certain low mental ages or intelligence quotients or not reaching certain low percentiles for 25 delinquent groups totalling 13,058 cases and an equal number of paired non-delinquent groups. The degree of relationship found in the case of Later Results of Tests of Verbal Abstract Intelligence is extremely variable, but tends to be marked. In correlational terms it may be represented by a coefficient of colligation rarely falling below .08 or above .65, and commonly lying between .36 and .52.

Lastly, it is important to note that in evaluating the findings for Later Results of Tests of Verbal Abstract Intelligence a consideration of the probable effect of various factors, including the method of expressing the test result, the type of test employed, a geographical disparity in the data for the paired groups, a difference in the ages of the paired groups, a difference in the racial composition of the paired groups, an unrepresentative intelligence distribution for the paired groups, a serious lack of uniformity in the step intervals used in expressing the test result for the paired groups, and an inequality in the social status of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general somewhat too high to represent the actual situation with respect to verbal abstract intelligence in delinquent and non-delinquent groups.

### *Results of Army Mental Tests*

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below:

Table 13. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Mental Ability<sup>20</sup>

<sup>20</sup> This term was suggested by the following statement by Thorndike in his report as chief of the statistical unit in the initial experiment with the group examination devised for Army use, given in a memoir of the National Academy of Sciences: "The group test is to be used to prophesy the mental ability which a man will display in the Army." (79, p. 316) It is also used in the same volume in the introductory statement of the Examiner's Guide for Psychological Examining in the Army (Second Revision), in which one of the purposes of the examination was given as follows: "... To classify soldiers according to their mental ability. . . ." (79, p. 153)

The information represented by these crucial percentages for delinquent and non-delinquent groups is the percentage making letter grades below D and below C—. The percentage making letter grades below D may be regarded as an approximate measure of the percentage characterized either by mental deficiency or by borderline intelligence, and the percentage making letter grades below C— as an approximate measure of the percentage characterized by mental backwardness, in the groups represented.

The crucial percentages described above were derived from data for delinquent groups reported by nine different authorities, and from similar data for comparable non-delinquent groups provided by these same authorities or supplied from the memoir of the National Academy of Sciences reporting army mental test results. The types of groups and the country represented by these crucial percentages are given below :

DELINQUENT	NON-DELINQUENT
Adult Criminals	Army Recruits
United States	United States
Juvenile Delinquents	Army Recruits
United States	United States

A detailed analysis of the crucial percentages for paired delinquent and non-delinquent groups which takes into account the forty-eight instances of comparison yields the following results:

#### RESULTS OF ARMY MENTAL TESTS

##### Percentage Making Letter Grades

Below D: 17 instances of positive comparison, 7 instances of negative comparison.

Below C—: 14 instances of positive comparison, 10 instances of negative comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to mental ability may be interpreted as follows:

Delinquent groups may show either a higher or a lower percentage making certain inferior army mental test letter grades than comparable non-delinquent groups, but the results of the comparison are on the whole clearly favorable to the non-delinquent groups.

From the standpoint of the problem under investigation, results of army mental tests in paired delinquent and non-delinquent groups may be summarized as follows:

A comparison between paired delinquent and non-delinquent groups as to mental ability affords very inconsistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage making certain inferior army mental test letter grades for 25 delinquent groups totalling 18,711 cases and an equal number of paired non-delinquent groups. The degree of relationship found in the case of Results of Army Mental Tests is relatively constant, and tends to be negligible. In correlational terms it may be represented by a coefficient of colligation approximating .04.

Lastly, it is important to note that in evaluating the findings for Results of Army Mental Tests a consideration of the probable effect of various factors, including a difference in the racial composition of the paired groups, an unrepresentative intelligence distribution for one of the paired groups, a geographical disparity in the data for the paired groups, and a difference in the ages of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general somewhat too low to represent the actual situation with respect to mental ability in delinquent and non-delinquent groups.

#### *Results of Tests of Non-Verbal Concrete Intelligence*

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below:

Table 14. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Non-Verbal Concrete Intelligence

The information represented by the crucial percentages for delinquent and non-delinquent groups is the percentage reaching or exceeding the norm. This percentage may be regarded as a rough measure of the percentage characterized by mental superiority in the groups represented, and hence the finding of a lower percentage for delinquents than for non-delinquents indicates a direct rather than an inverse relation between delinquency and mental inferiority.

The crucial percentages described above were derived from data for delinquent groups reported by two different authorities, and from similar data for comparable non-delinquent groups provided

by these same authorities. The types of groups and the country represented by these crucial percentages are given below :

DELINQUENT	NON-DELINQUENT
Juvenile Delinquents	Army Recruits or School Children
United States	United States

A detailed analysis of the crucial percentages for paired delinquent and non-delinquent groups which takes into account the two instances of comparison yields the following results :

#### RESULTS OF TESTS OF NON-VERBAL CONCRETE INTELLIGENCE

Test Result Expressed as

Percentage Reaching or Exceeding Norm: 2 instances of positive comparison.

In the light of this analysis, the comparison between paired delinquent and non-delinquent groups as to non-verbal concrete intelligence may be interpreted as follows :

Delinquent groups may be expected to show a lower percentage reaching or exceeding a non-verbal intelligence test norm than comparable non-delinquent groups.

From the standpoint of the problem under investigation, results of tests of non-verbal concrete intelligence in paired delinquent and non-delinquent groups may be summarized briefly as follows :

A comparison between paired delinquent and non-delinquent groups as to non-verbal concrete intelligence affords significant evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage reaching or exceeding a non-verbal intelligence test norm for 2 delinquent groups totalling 1,589 cases and an equal number of paired non-delinquent groups. The degree of relationship found in the case of Results of Tests of Non-Verbal Concrete Intelligence is decidedly variable, but tends to be low. In correlational terms it may be represented by a coefficient of colligation approximating .21.

Lastly, it is important to note that in evaluating the findings for Results of Tests of Non-Verbal Concrete Intelligence a consideration of the probable effect of various factors, including the type of test employed and a difference in the ages of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general

somewhat too high to represent the actual situation with respect to non-verbal concrete intelligence in delinquent and non-delinquent groups. At the same time, it should be recognized that the small amount of data represented and the extreme divergence of the results make it necessary to regard this finding as tentative only.

### *Results of Tests of Mechanical Intelligence*

The data to be considered are confined to the crucial percentages for paired groups contained in the detailed table presented in the monograph reporting the comparative study under the title given below :

Table 15. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Mechanical Intelligence

The information represented by the crucial percentages for delinquent and non-delinquent groups is the percentage reaching or exceeding the norm. This percentage may be regarded as a rough measure of the percentage characterized by mental superiority in the groups represented, and hence the finding of a lower percentage for delinquents than for non-delinquents indicates a direct rather than an inverse relation between delinquency and mental inferiority.

The crucial percentages described above were derived from data for delinquent groups reported by two different authorities, and from similar data for comparable non-delinquent groups provided by these same authorities. The types of groups and the country represented by these crucial percentages are given below :

DELINQUENT	NON-DELINQUENT
Juvenile Delinquents	School Children
United States	United States

A detailed analysis of the crucial percentages for paired delinquent and non-delinquent groups which takes into account the five instances of comparison yields the following results :

#### RESULTS OF TESTS OF MECHANICAL INTELLIGENCE

Test Result Expressed as

Percentage Reaching or Exceeding Norm : 3 instances of positive comparison, 2 instances of negative comparison.

In the light of this analysis, the comparison between paired

delinquent and non-delinquent groups as to mechanical intelligence may be interpreted as follows:

Delinquent groups may show either a lower or a higher percentage reaching or exceeding a mechanical intelligence test norm than comparable non-delinquent groups, but the results of the comparison are on the whole slightly in favor of the non-delinquent groups.

From the standpoint of the problem under investigation, results of tests of mechanical intelligence in paired delinquent and non-delinquent groups may be summarized briefly as follows:

A comparison between paired delinquent and non-delinquent groups as to mechanical intelligence affords very inconsistent evidence of a direct relation between delinquency and mental inferiority. The data considered consist of information as to the percentage reaching or exceeding a mechanical intelligence test norm for 5 delinquent groups totalling 454 cases and an equal number of paired non-delinquent groups. The degree of relationship found in the case of Results of Tests of Mechanical Intelligence is somewhat variable, but tends to be negligible. In correlational terms it may be represented by a coefficient of colligation commonly lying between .00 and .08.

Lastly, it is important to note that in evaluating the findings for Results of Tests of Mechanical Intelligence a consideration of the probable effect of various factors, including the type of test employed, an unrepresentative intelligence distribution for one of the paired groups, and a difference in the racial composition of the paired groups, leads to the conclusion that the degree of relationship found in the case of the present type of evidence is in general a fairly accurate representation of the situation with respect to mechanical intelligence in delinquent and non-delinquent groups.

## CHAPTER V

### AN ACCOUNT OF THE STATISTICAL REDUCTION OF THE NON-CORRELATIONAL STUDIES

THE practical necessity for the statistical reduction of the non-correlational studies is to be found in the large amount of data bearing upon the problem of the relation between delinquency and mental inferiority which had been assembled in the tabular review of these studies.<sup>1</sup> In fact, the two types of results obtained by the statistical reduction of the non-correlational studies served a useful purpose in the combination of certain data in the tabular review or in the interpretation of the individual tables, and also played their part in the abridged review of these studies presented in the preceding chapter.

The following procedures were employed in the statistical reduction of the non-correlational studies: (1) the calculation of pooled percentages, and (2) the calculation of coefficients of colligation. A full account of these two procedures will be given in the succeeding sections.

#### SECTION I

##### THE CALCULATION OF POOLED PERCENTAGES

As indicated at the beginning of this chapter, the calculation of pooled percentages constituted the first procedure employed in the statistical reduction of the non-correlational studies.

These pooled percentages were calculated for each type of group and country or for certain minor classifications of the data from the most significant data included in the detailed tables of the

<sup>1</sup>As explained in the preceding chapter, the tabular review of non-correlational studies of the relation between delinquency and mental inferiority, which consists of fifteen tables, is presented in a separate monograph by the author, entitled *A Comparative Study of Delinquents and Non-Delinquents*.



tabular review,<sup>2</sup> which in turn constitute the data summarized in the abridged review of non-correlational studies of the relation between delinquency and mental inferiority.

In this section rules followed in selecting the most significant data from the detailed tables of the tabular review and rules followed in calculating pooled percentages will be briefly formulated.

*Rules Followed in Selecting the Most Significant Data from the Detailed Tables of the Tabular Review*

In view of the great mass of data included in the tabular review of non-correlational studies, the practical wisdom of selecting for statistical reduction the data of greatest importance from the standpoint of the relation between delinquency and mental inferiority is at once apparent.

The rules followed in selecting the most significant data from the detailed tables of the tabular review reflect at once the main interest of the present investigation, the practical needs of the procedure determined upon for the statistical reduction, and the data actually available. These rules may be stated as follows:

1. Select the data of greatest importance for a consideration of the problem of the relation between delinquency and mental inferiority. Accordingly,

a. In the case of data tabulated for feeble-minded and non-feeble-minded groups, utilize the percentage delinquent.

b. In the case of data tabulated for delinquent and non-delinquent groups, utilize the percentage mentally inferior, choosing both the percentage presumably characterized by mental deficiency and the percentage presumably characterized either by mental deficiency or by borderline intelligence, if available;<sup>3</sup> or, as alternatives, the percentage presumably characterized by mental backwardness or the percentage presumably characterized by mental superiority,<sup>4</sup> the latter being interpreted from the stand-

<sup>2</sup>In order to avoid circumlocution, in this account and elsewhere in the research it is usually overlooked that certain percentages in the tables could not be pooled because no percentages which could be combined with them were available in the data tabulated. Individual percentages of this type served the same purposes as pooled percentages, and hence are designated as such in the appropriate connections.

<sup>3</sup>In a single instance in which the preferred percentages were available another percentage was chosen. The type of evidence concerned is Reports of Amount of Schooling. The particular circumstances calling for this exception have already been explained in the appropriate connection in the preceding chapter.

<sup>4</sup>The particular percentages chosen as representative of the two grades of

point of the relation between delinquency and mental inferiority.<sup>6</sup>

2. Select the data best adapted to statistical reduction by means of the procedures determined upon. Accordingly,

a. Throughout the tabular review of non-correlational studies, eliminate all non-percentage data.

b. From the tables in which data are presented for paired feeble-minded and non-feeble-minded or paired delinquent and non-delinquent groups, eliminate all percentages for experimental groups which cannot be paired with percentages for control groups; similarly, eliminate all percentages for control groups which cannot be paired with percentages for experimental groups.

c. From the tables in which data are presented for unpaired delinquent or non-delinquent groups, eliminate all percentage data which will not contribute to the calculation of pooled percentages adapted for use in the calculation of coefficients of colligation.<sup>9</sup>

3. In the instances of possible choice between the percentages for total groups and sub-groups represented in a given study, select the percentages which will permit the most minute comparison possible between the paired groups.<sup>7</sup>

The application of the rules formulated above resulted in the

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mental inferiority named or as representative of their alternatives in the case of a given type of evidence were of course dependent upon the data available. The rough equivalence of the percentages actually chosen to the classifications specified in the case of data for delinquent and non-delinquent groups has already been indicated in the appropriate connections in the preceding chapter. Likewise, the rough equivalence of the percentage chosen in the case of data for feeble-minded and non-feeble-minded groups has been indicated in a similar connection.

It should be noted that it has been deemed unnecessary to take the factor of chronological age into consideration in the formulation of the standards of mental deficiency and of mental deficiency plus borderlinity for the practical purposes of the selection of the most significant data from the detailed tables of the tabular review, in view of the maturity of most of the delinquent groups for whom data are tabulated, the limitations imposed by the nature of the data, and the relatively simple correlational procedure adopted for use in their statistical reduction.

<sup>6</sup> Thus coefficients which indicate either a positive or a negative relation between delinquency and mental superiority rather than between delinquency and mental inferiority calculated from these percentages are interpreted as negative if positive and as positive if negative.

<sup>7</sup> Specific rules for selecting the most satisfactory percentages for delinquent and non-delinquent groups for use in the tables in which types of groups are compared will be found in the monograph presenting the tabular review of non-correlational studies of the relation between delinquency and mental inferiority (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 2, C).

<sup>9</sup> Detailed rules for comparing data for paired groups in the comparative study will be found in the monograph referred to above (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 3).

selection of the crucial percentages for feeble-minded and non-feeble-minded and for delinquent and non-delinquent groups upon which the abridged review of non-correlational studies of the relation between delinquency and mental inferiority is based, and provided the data utilized in the calculation of pooled percentages.

*Rules Followed in Calculating Pooled Percentages*

It is doubtless apparent that the primary methods of classification applied to the tabular reviews throughout the research, which are also common to the tabular review of non-correlational studies, provide natural groupings of closely related data. Generally speaking, therefore, pooled percentages were calculated in the case of the different types of evidence for each type of group and country from the crucial percentages for feeble-minded and non-feeble-minded and for delinquent and non-delinquent groups. Under certain circumstances, however, minor classifications of the data marked the limits of the percentages combined.

The rules followed in calculating pooled percentages not only preserved the natural groupings of the data, but at the same time took into account the great variation in the size of the populations represented by the groups for which data were to be combined, and, in addition, since the experimental and the control groups were generally of unlike population, sought to equalize the data included in the pooled results for paired groups by providing for equal representation in these results on the part of the crucial percentages for any pair of component individual groups. These rules may be stated as follows:

1. In a particular table or in one of the major divisions of a table, combine in a single pooled percentage the crucial percentages for feeble-minded, non-feeble-minded, delinquent, or non-delinquent groups entered in a given column of the table for each type of group and country, with the following exceptions:

a. In the case of data tabulated for unpaired non-delinquent groups, within the classifications of the data indicated above, pool separately the crucial percentages for the two grades of feeble-mindedness differentiated in the tables.<sup>8</sup>

b. In the case of data tabulated for paired delinquent and non-delinquent groups, within the classifications of the data indicated

<sup>8</sup> The data in question are included in Tables 3 and 10 of the tabular review of non-correlational studies, as presented in the monograph reporting the comparative study and briefly described in the preceding chapter.

above, pool separately the crucial percentages for the various intelligence tests differentiated in the tables.<sup>9</sup>

2. In combining the percentages appropriate to the calculation of a given pair of pooled percentages representing the corresponding experimental and control groups, weight the individual percentages for paired feeble-minded and non-feeble-minded groups according to the number of cases for the corresponding feeble-minded group, and the individual percentages for paired delinquent and non-delinquent groups according to the number of cases for the corresponding delinquent group, a weight of 1 being assigned to numbers below 100, a weight of 2 to numbers ranging from 100 to 199, a weight of 3 to numbers ranging from 200 to 299, and so on.<sup>10</sup>

3. In combining the percentages appropriate to the calculation of a given pooled percentage representing unpaired experimental or control groups, weight the individual percentages for unpaired delinquent groups according to the number of cases for the respective delinquent group, weights of 1, 2, 3, and so on being assigned<sup>10</sup> in the manner indicated above; on the other hand, weight the individual percentages for unpaired non-delinquent groups according to the nature of the data for each group, weights of 11, 6, 2, or 1 being assigned<sup>10</sup> in accordance with a routine schedule.<sup>11</sup>

4. In applying the procedure for calculating pooled percentages, supply omissions in the number of cases for percentages required in the calculations, and likewise for percentages which cannot be combined, in accordance with a routine procedure, which requires that a reasonable population, ranging in general from 100 to 1,000 cases for principal groups and from 50 to 500 for subordinate groups, be inferred from the nature of the data for the group in question.<sup>11</sup>

5. After the appropriate weights have been applied, calculate the required weighted mean percentages by finding the sum of the products of the weighted individual percentages which are to be

<sup>9</sup> The data in question are included in Tables 12-15 of the tabular review of non-correlational studies, as presented in the monograph reporting the comparative study and briefly described in the chapter referred to in the preceding footnote.

<sup>10</sup> The actual weights assigned will be found in the abbreviated tabulations of crucial percentages derived from the tabular review of non-correlational studies presented in the monograph already referred to (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 4).

In the derivation and the application of these weights and in the subsequent tabulation of the combined results, all qualifying words, phrases, or symbols referring to the numbers of cases or the percentages concerned were disregarded.

<sup>11</sup> The schedules utilized in calculating pooled percentages will be found in rules for weighting crucial percentages and rules for supplying omissions in the number of cases, as given in the monograph referred to above (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 5, A and B).

combined, and dividing the resulting figure by the sum of the weights applied to the percentages in question.

The resulting weighted mean percentages and the corresponding individual percentages which could not be combined, in each case appropriately paired, constituted the pooled percentages which were derived in the statistical reduction of the non-correlational studies, and provided the data utilized in the calculation of coefficients of colligation.

## SECTION 2

### THE CALCULATION OF COEFFICIENTS OF COLLIGATION

As indicated at the beginning of this chapter, the calculation of coefficients of colligation constituted the second procedure employed in the statistical reduction of the non-correlational studies.

These coefficients of colligation were calculated from the pooled percentages for paired feeble-minded and non-feeble-minded and for paired delinquent and non-delinquent groups obtained in the manner described in the preceding section.

In this section an explanation of the coefficient of colligation and its use in the investigation will be followed by a justification of the correlational procedure employed in the statistical reduction.

#### *An Explanation of the Coefficient of Colligation and Its Use in the Investigation*

The coefficient of colligation *omega*, devised by Yule, is one of the coefficients of association. The formulae for the coefficient and its probable error, taken from Burt (cf. 66, pp. 217-18) are as follows:

$$\omega = \frac{1 - \sqrt{\frac{N_p P_n}{P_p N_n}}}{1 + \sqrt{\frac{N_p P_n}{P_p N_n}}}$$

$$P. E. \omega = .6745 \frac{1 - \omega^2}{4} \sqrt{\frac{1}{P_p} + \frac{1}{P_n} + \frac{1}{N_p} + \frac{1}{N_n}}$$

The meaning of the symbols in the formulae will be evident from the following diagram, adapted from the "fourfold table" presented by Burt (cf. 66, p. 217):

		First Classification: Delinquency		Totals
		Positive: Delinquent	Negative: Non-Delinquent	
Second Classifica- tion: Feeble- Mindedness	Positive: Feeble- Minded	Positive—positive $P_p$ Delinquent— feeble-minded	Negative—positive $N_p$ Non-delinquent— feeble-minded	$p = P_p + N_p$
	Negative: Non-Feeble- Minded	Positive—negative $P_n$ Delinquent— non-feeble-minded	Negative—negative $N_n$ Non-delinquent— non-feeble-minded	$n = P_n + N_n$
Totals		$P = P_p + P_n$	$N = N_p + N_n$	$P + N = p + n = P_p + P_n + N_p + N_n$

In further explanation of the coefficient of colligation, it should be stated that if the subdivisions of the two main classifications are percentages, thus making  $P$  and  $N$  both equal to 100, and as a result making  $P_n = 100 - P_p$  and  $N_n = 100 - N_p$ , the coefficient can be obtained at once by the use of the two percentages in question; and thus the necessity for discovering the figures required in the other two compartments of the diagram by an independent study is obviated.<sup>12</sup>

In its ordinary use, the coefficient of colligation, whether calculated from paired percentages or from more basic data, is obtained from the data procured by one investigator. In the present investigation of the relation between delinquency and mental inferiority, the coefficients of colligation obtained in the statistical reduction of the non-correlational studies normally were calculated from pooled percentages derived from data for feeble-minded or delinquent groups procured by two or more investigators and data for appropriately paired non-feeble-minded or non-delinquent

<sup>12</sup> Attention is called to this advantage by Burt, upon whose discussion the above explanation is based; moreover, this authority presents a graph "which enables the investigator to read off at a glance the approximate value of the association coefficient directly two such percentages are obtained" (cf. 66, pp. 218-19). This graph has not been utilized, however, in obtaining coefficients of colligation in the present research, because of the greater accuracy resulting from the actual calculation of the coefficients.

groups provided in some cases by the original investigator and in other cases by the present author. To be sure, by chance paired percentages for an experimental and a control group representing data procured in the usual manner, or a single percentage for an experimental group provided by the original investigator and a single percentage for a control group supplied by the present author, were involved in the calculation of these coefficients.

Presumably the effect of calculating a coefficient of colligation from paired percentages representing the combined results of several studies rather than from paired percentages representing the results of a single study would be to increase the reliability of the coefficient thus obtained. It should be noted, however, that the formula for the calculation of the probable error of the coefficient of colligation, given earlier in this explanation, applies only to coefficients of colligation calculated from single paired percentages.

The coefficients of colligation obtained from paired pooled percentages afforded the means of incorporating the most significant data presented in the tabular review of non-correlational studies of the relation between delinquency and mental inferiority in the corresponding tabular review of correlational studies which will be presented in the succeeding chapter. Accordingly, the coefficients in question, together with the pooled percentages from which they were derived, constitute the core of Table I of the forthcoming tabular review.

A further use of these coefficients has already been served in the preceding chapter in permitting the interpretation of the findings of the various types of evidence represented by the non-correlational studies in correlational terms. Of still more importance is the fact that only by virtue of these coefficients does the tabular review of non-correlational studies affect the final conclusion of the research as to the relation between morality and intellect.

#### *A Justification of the Correlational Procedure Employed in the Statistical Reduction*

In view of the nature of much of the data included in the tabular review of non-correlational studies, and in view of the fact that pooled percentages representing the most significant data were available as a result of the procedure described in the preceding section, the practical convenience of employing a correlational procedure which requires no other data than two appro-

priately paired percentages for accomplishing the statistical reduction of these studies is at once apparent.

Further justification than practical convenience, however, must be sought for the use of this procedure. Such justification is believed to be afforded by the critical and apparently satisfactory use of the coefficient of colligation by Slawson in the United States and by Burt in England for determining the association between juvenile delinquency and various measures of mental inferiority.<sup>13</sup> Brief quotations from the writings of these authors will serve to indicate the applicability of the procedure in question to the present investigation of the relation between delinquency and mental inferiority.

In the report to the London County Council entitled *Mental and Scholastic Tests*, Burt shows the appropriateness of a coefficient of association technique in the following passage:

"The relations of moral delinquency, on the one side, to mental deficiency and educational backwardness, on the other, can be most concisely compared by the statistical device of 'association coefficients.' A coefficient of association is a fraction, varying from zero to plus or minus unity, designed to measure the degree of correlation between attributes which are not themselves quantitatively graded. Delinquency and, for administrative purposes, even mental deficiency and educational backwardness, are such attributes. A child either is or is not delinquent; he either does or does not require transference to a special school or special class." (66, p. 188)

In his book *The Delinquent Boy*, Slawson gives his reasons for the choice of the coefficient of colligation, as follows:

<sup>13</sup> Critical discussions of the coefficient of colligation and of certain related coefficients are given by Slawson in the book referred to in the accompanying text (97, pp. 162-63), and by Burt in the London County Council report which is also cited (66, pp. 218, 220).

Since these discussions are essentially favorable to the use of the coefficient of colligation, it is important to note that a highly technical discussion of coefficients of this type by Pearson and Heron in an article on theories of association, published several years earlier, expresses a very different attitude. Thus these authors state: "We think we have sufficiently indicated that . . . coefficients of association and colligation fail entirely for any variates which may be suspected in any way of continuity. . . ." (85, p. 205)

It may be added that in concluding a discussion of fallacies involved in the use of percentages, these authors make the following comment with reference to the coefficient of colligation: "The coefficient is a 'colligation,' not a 'profound truth.'" (85, p. 294)



"The coefficient of colligation, omega, . . . was . . . chosen for our work because none of the assumptions underlying  $r_t$  are necessary for its computation, nor is it dependent upon the relative proportions of A's and a's like  $r_t$  and  $r_{ps}$ . In addition, it does not yield gratuitous values like  $Q$  for relations involving extreme dichotomies such as we have here. It yields values more nearly what the well known  $r$  would yield were the attributes really variable than  $Q$  does." (97, p. 163)

Similarly, Burt justifies his own selection of this coefficient in the following quotations taken from the report referred to above:

"Since the distribution of intelligence is approximately normal, it might be thought at first sight more advisable to use  $r_t$ , or  $\sin(\frac{\pi}{2} \omega)$  as an approximation to  $r_t$ . But where the points of division lie far from the medians, . . . these coefficients give values that may be illusively high." (66, p. 220)

"To avoid misconception I may add that I use the colligation coefficient  $\omega$  only as a rough measure for rough experimental tests. To determine the precise relation between general intelligence and the mental functions tested, we should, I believe, first cast our tests into an 'internally graded' form. As indicated in the text, this could be done in detail for most of the problems in the Binet-Simon scale. The product moment coefficient could then be directly computed. Where 'internal grading' is out of the question, or alters the issue, then for final conclusions tetrachoric  $r$  should be calculated at length and other suitable formulae used as controls. Such technical elaborations, however, would clearly be inappropriate to the present data or to the present work." (66, p. 220, fn.)

In the book already cited, Slawson gives the precise function served by coefficients of colligation in these words:

"These coefficients . . . simply give us a gross determination of the association between inferiority of intelligence and delinquency, by merely considering the number who are and the number who are not inferior, without at all taking into consideration the gradations that exist (from worst to best) in the variables, intelligence and delinquency." (97, p. 77)

In further explanation of the function served by coefficients of colligation, it is appropriate to quote the following passage taken from *The English Convict*, by Goring, illustrating the purpose of the tetrachoric coefficient of correlation, since it is also significant for other coefficients obtained from data grouped into alternative categories:

"... the fourfold table is a method particularly appropriate for correlating mental and moral characters in man: characters which, although they cannot be precisely measured on a finely divided scale, can be broadly classified as belonging to one or other of two sections of this scale. For, just as with regard to their physical characters, individuals can be classified fairly accurately, without precise measurements being taken, as tall and short, . . . so can they be classified—and every day the world colloquially does so classify them—by broad distinctions with regard to their mental and moral characters, as intelligent and stupid, righteous and iniquitous, . . . and so forth." (45, p. 342)

Another point of considerable interest concerns the theoretical relationship existing between the coefficient of colligation and the tetrachoric and the product-moment coefficients of correlation. These relationships are pointed out by Burt in the connection previously cited in the quotations given below:

"Sin ( $\frac{\pi}{2}\omega$ ) might be used as a rough approximation to  $r_t$ . Indeed, in the symmetrical fourfold table that is formed from a 'normal' correlation by taking the points of division between P and N, p and n at the medians, the correlation can be shown mathematically to be

$$r_t = \text{Sin} \left( \frac{\pi}{2}\omega \right),$$

Thus  $\omega$  (Yule's 'colligation' coefficient) and  $r_t$  are related somewhat as  $R$  (Spearman's 'footrule' coefficient) and  $r$ . The tables for converting  $r$  into  $R$  . . . can be used for obtaining  $r_t$  approximately from  $\omega$ , provided the points of division are not far from the medians." (66, p. 220)

"To those more familiar with such coefficients of correlation as  $r$ , . . .  $\omega$  . . . possesses this advantage: it is mathematically equivalent to the product-sum [that is, product-moment] correlation,  $r$ , for the corresponding symmetrical fourfold table, *i.e.*, for the case where each of the four main classes, whether positive or negative, contains the same number of individuals, namely, half of the grand total. . . ." (66, pp. 218, 220)

Since the coefficient of colligation is classed by Kelley as one

<sup>14</sup> Qualifying his statement with reference to the product-sum correlation in this quotation, Burt adds the following footnote: "Calculated, however, it should be added, as if the distributions were not normal but rectilinear, that is, as a correlation of ranks where the ranking runs to no more than two places, and without any correction whatever for treating what may in fact be continuous variables, distributed more or less normally, as though they involved the mere addition of discrete units." (66, p. 218, fn.)

of the "measures of correlation not equivalent to the product-moment coefficient" (cf. 58, p. 260), in concluding this discussion it is important to consider the possible application to the present investigation of the fact that, according to this authority, certain exceptional circumstances might conceivably exist in which the coefficient of colligation could properly be used for the product-moment coefficient. These circumstances are indicated by Kelley in the passage in his *Statistical Method* quoted below:

"Conditions which would warrant its use as a measure equivalent to a product-moment coefficient of correlation are seldom present. They are (a) point distribution in the traits and (b) warrant for equalization of the table. Warrant for equalizing may occasionally be present; as for example, if ten men and 100 women are measured and it is desired to find the correlation when the population of men and women are equal, but it is difficult to think of a reasonable problem in which there would be warrant for equalizing in the case of both traits." (58, p. 261)

An analysis of the extent to which the conditions prescribed by Kelley were met in this investigation leads to the conclusion that the first condition was met not at all, and the second only in part. Thus, with reference to the first condition it may be pointed out that delinquency and mental inferiority, even if not quantitatively graded,<sup>15</sup> are actually continuous functions. In fact, Burt clearly shows the continuous nature of delinquency in the following quotation taken from his book *The Young Delinquent*:

"There is . . . no sharp line of cleavage by which the delinquent may be marked off from the non-delinquent. . . . It is all a problem of degree, of a brighter or a darker gray." (16, p. 13)

Similarly, in an article on theories of association Pearson and Heron<sup>16</sup> call attention to the continuous nature of mental inferiority in these words:

"No one who has studied the essential difficulty of defining what is feeble-minded will doubt the continuity of mental dulness. It is not a discrete character, but a continuous variate. There are certainly all grades of mental defect, and the groups idiot, imbecile,

<sup>15</sup> Compare the argument advanced by Burt quoted earlier in this discussion.

<sup>16</sup> A quotation taken from these writers is especially interesting in this connection in view of their criticism of coefficients of colligation given at the beginning of this discussion.

feeble-minded, 'simple' are quite artificial. If the whole population were graded according to intelligence, the frequency curve would be continuous. . . ." (85, p. 190)

It follows, therefore, that point distribution in the traits cannot be claimed for the present data.

On the other hand, with reference to the second condition it should be called to mind that the necessity of affording equal representation to paired experimental and control groups in the calculation of pooled percentages for paired groups in the statistical reduction of the non-correlational studies, led to the provision for weighting the constituent individual percentages for paired feeble-minded and non-feeble-minded or for paired delinquent and non-delinquent groups according to the population of the corresponding feeble-minded or delinquent groups. The reason for this procedure is apparent if it be recalled that the paired groups were generally of unlike population. As a result, without the method adopted, differing proportions of the various sexes, ages, races, or what not, represented by the individual percentages for the paired groups, would be incorporated in the pooled percentages derived from them. Accordingly, in the instances in which two or more paired percentages were combined,<sup>17</sup> warrant for equalizing the table existed and was taken advantage of to the limited extent indicated.

In view of these considerations it is evident that the coefficient of colligation cannot be regarded as fully equivalent to the product-moment coefficient of correlation. On the other hand, in view of the shortcomings of much of the data available in the tabular review of non-correlational studies, it is further apparent that the utilization of the most elaborate correlational procedure could result in nothing more than an approximation to the relationship investigated; and an approximation is precisely what may be expected from the use of the procedure selected.<sup>18</sup> Lastly, it may be

<sup>17</sup> Reference to Table I in the next chapter, presenting coefficients of colligation between measures of delinquency and mental inferiority obtained by the statistical reduction of the non-correlational studies, will show that two or more paired percentages were involved in the calculation of approximately one-half of the coefficients presented. It should be noted that when single paired percentages served as pooled percentages no weights were applied to either percentage.

<sup>18</sup> Questioned regarding this procedure, in a personal letter to the author, dated May 31, 1929, Professor T. L. Kelley makes the following comment: "Your treatment is quite different from that which I would have myself

observed that the nature of the relation revealed by the coefficient of colligation is not subject to question, but may be verified by inspection of the paired percentages concerned.

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advised, but I doubt not that your results are reasonable in the sense that they point in the true direction. I do believe that a much more convincing and conclusive argument could have been made, in short, I consider your findings to constitute an understatement of the real situation." In a second letter, dated June 12, 1929, he says further: "I would have used a very different technique,—one based upon contingency. With the problem in the stage it is now in I would say that that is now out of the question. Furthermore I have no reason to believe that the method that you have actually employed is misleading in its major emphasis and conclusions."

In the connection cited in an earlier footnote, Slawson gives the following reason for his decision not to use a common contingency technique in similar circumstances in his own investigation: "The contingency coefficient (C) was dismissed from our consideration because it has been demonstrated by Yule that this coefficient is greatly influenced by the number of cells in the association table and that for a  $2 \times 2$  table, the greatest possible value for C is about .71." (97, p. 163)

## CHAPTER VI

### A TABULAR REVIEW OF CORRELATIONAL STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY

THE present tabular review of correlational studies of the relation between delinquency and mental inferiority incorporates the data included in the abridged review of non-correlational studies by virtue of the statistical reduction of these studies, and at the same time, by the inclusion of correlational studies reported in the literature, complements this review. Because of this representation of the non-correlational studies, and also because of the great importance of some of the correlational studies included, this review affords very significant evidence as to the relation between delinquency and mental inferiority, and hence as to the relation between morality and intellect.

As previously indicated, studies of the relation between delinquency and mental inferiority are principally non-correlational. In fact, until recently only occasional investigators made use of correlational procedures in studies in delinquent groups. Although the tendency to use such procedures has become much more noticeable in these later years, correlational studies of the relation between delinquency and mental inferiority are still comparatively few in number. Even so, the correlational procedures employed are especially varied in character. Thus no fewer than five types of coefficients have been reported in the literature. Since one of these types represents the correlational procedure employed in the statistical reduction of the non-correlational studies, the review of correlational studies in delinquent groups included in this chapter is concerned with the following series of coefficients calculated between measures of delinquency and mental inferiority: (1) coefficients of colligation obtained by the statistical reduction of the non-correlational studies, (2) coefficients of colligation reported in the literature, (3) correlation ratios, (4) tetrachoric coefficients

of correlation, (5) rank-difference coefficients of correlation, and (6) product-moment coefficients of correlation.

The several series of coefficients enumerated above have been assigned to six tables, which together constitute the tabular review of correlational studies of the relation between delinquency and mental inferiority.<sup>1</sup> These tables will be presented and interpreted in order in the succeeding sections.

## SECTION I

### COEFFICIENTS OF COLLIGATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY OBTAINED BY THE STATISTICAL REDUCTION OF THE NON-CORRELATIONAL STUDIES

Table I presents coefficients of colligation between measures of delinquency and mental inferiority obtained by the statistical reduction of the non-correlational studies.<sup>2</sup>

The coefficients presented in this table were calculated from the pooled percentages for paired feeble-minded and non-feeble-minded and for paired delinquent and non-delinquent groups which were derived for each type of group and country and for certain minor classifications of the data from the most significant data included in the detailed tables of the tabular review of non-correlational studies of the relation between delinquency and mental inferiority.<sup>3</sup>

<sup>1</sup> A frequency distribution of the coefficients showing the degree of relationship found between delinquency and mental inferiority, including the most significant correlational results presented in Part I A, as tabulated in this review, is given in Appendix IV, Section 1. In this distribution the results for the several types of coefficients and the individual tables are analyzed by types of evidence, and may be identified by the numbers of the tables as given in the analysis.

In the tabulation of the different types of coefficients in the present review, on the assumption that coefficients obtained by non-standard methods would be so designated, in the absence of evidence to the contrary undesigned coefficients as well as coefficients designated as product-moment were assigned to the table of product-moment coefficients of correlation.

<sup>2</sup> An account of the statistical reduction of the non-correlational studies will be found in the preceding chapter.

<sup>3</sup> It will be recalled that the data from which these coefficients were calculated are summarized in the abridged review of non-correlational studies of the relation between delinquency and mental inferiority presented in Chap-

The table has two major divisions, which serve to differentiate the various coefficients according to the type of subjects represented. These major divisions are designated as follows:

- A. Calculated from Data for Paired Feeble-Minded and Non-Feeble-Minded Groups.
- B. Calculated from Data for Paired Delinquent and Non-Delinquent Groups.

These two divisions of the table contain the routine information required in a tabular review of correlational studies in delinquent groups, adapted to the presentation of combined rather than individual studies, and the distinctive information appropriate to the particular coefficients tabulated, including in the first division of the table the number of percentages pooled, the percentage delinquent (feeble-minded and non-feeble-minded), and the coefficient of colligation, with its probable error if reported; and in the second division of the table the number of percentages pooled, the percentage mentally inferior (delinquent and non-delinquent), and the coefficient of colligation, with its probable error if reported.

The table also has a number of minor divisions in the case of the data for two types of evidence, which correspond to the main divisions of the data in question provided for in the tabular review of non-correlational studies. In the first case these minor divisions serve to differentiate the various reports of school progress according to their treatment of the relative ages of the paired groups, and are designated as follows:

Data Which Take into Consideration the Difference in the Ages  
of the Paired Groups

Data Which Disregard the Difference in the Ages of the Paired  
Groups

In the second case these minor divisions serve to differentiate the various results of tests of verbal abstract intelligence according to the periods represented in the use of these tests, and still further for one part of the data according to the method of expressing the test result, and are designated as follows:

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ter IV of this volume, measures of the dispersion or the central tendencies of these coefficients also being given in the brief summaries for each type of evidence included in the chapter; and that the tabular review of non-correlational studies of this relationship is presented in a separate monograph (cf. *A Comparative Study of Delinquents and Non-Delinquents*).



EARLIER RESULTS

LATER RESULTS:

Data with the Test Result Expressed as Mental Age

Data with the Test Result Expressed as Intelligence Quotient

Data with the Test Result Expressed as Amount of Overlapping

The major and minor types of evidence as to the relation between delinquency and mental inferiority contributed by the data tabulated are as follows:

REPORTS CONCERNING DELINQUENCY.

ESTIMATES OF MENTAL DEFICIENCY.

REPORTS OF EDUCATIONAL STATUS: Reports of Illiteracy, Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Army Mental Tests, Results of Tests of Non-Verbal Concrete Intelligence, Results of Tests of Mechanical Intelligence.

The following types of groups are represented by the studies reviewed in the table:

FEEBLE-MINDED GROUPS: General Feeble-Minded Population, Feeble-Minded Persons at Large in Community, Feeble-Minded Persons in Institutions, Feeble-Minded Children in Public Schools.

DELINQUENT GROUPS: Adult Criminals, Juvenile Delinquents, Sex Offenders, Alcoholics.

The following countries are likewise represented by the studies reviewed in the table:

FEEBLE-MINDED GROUPS: No Specific Country, United States, Great Britain, Belgium.

DELINQUENT GROUPS: United States and Canada, United States, Canada, Porto Rico, Philippine Islands, Great Britain and Ireland, Great Britain, France, Sweden, Central Europe, Germany, Australia.

The coefficients of colligation between measures of delinquency and mental inferiority obtained by the statistical reduction of the non-correlational studies presented in Table I afford practically consistent evidence of a direct association between morality and intellect.

TABLE I\*

COEFFICIENTS OF COLLIGATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY  
OBTAINED BY THE STATISTICAL REDUCTION OF THE NON-CORRELATIONAL STUDIES  
A. CALCULATED FROM DATA FOR PAIRED FEEBLE-MINDED AND NON-FEEBLE-MINDED GROUPS

FEEBLE-MINDED <sup>a</sup>				FEEBLE-MINDED AND NON-FEEBLE-MINDED							
AUTHORITY <sup>b</sup>	DATE OF INVESTIGATION <sup>c</sup>	TYPE OF GROUP AND COUNTRY	No. OF CASES <sup>d</sup>	MEASURES		COEFFICIENT OF COLLIGATION <sup>e</sup>					
				DELINQUENCY	MENTAL INFERIORITY	NO. OF PERCENT-AGES POOLED <sup>f</sup>	PERCENTAGE DELINQUENT				
							FEEBLE-MINDED	NON-FEEBLE-MINDED			
Kohs (61), Wallin (115) Smith (98) Tredgold (109)	1916-1922 1924 1916	General Feeble-minded Population	[3,000] [1,000] [1,000]	REPORTS CONCERNING DELINQUENCY			3 1 1	7.0 20 10	2 0.1 0.5	.32 .88 .65	±.12 ±.14
		No Specific Country		Classification among general feeble-minded population							
		United States									
		Great Britain									
		Feeble-Minded Persons at Large in Community		Classification among feeble-minded persons at large in community							
V. V. Anderson (4), Farrell (34), Miner (73), Smith (98)	1915-1924	United States	1,211	Classification as delinquent	Classification among feeble-minded persons in institutions	5	11.5	1.3	.52		
		Feeble-Minded Persons in Institutions									
Merrill (71), Porteus (90)	1918-1922	United States	856	Classification as delinquent	Classification among feeble-minded persons in institutions	2	22.4	0.1	.89		
		Great Britain									
Wallin (115)	1909		[1,000]			1	4	0.8	.39	±.18	

## B. CALCULATED FROM DATA FOR PAIRED DELINQUENT AND NON-DELINQUENT GROUPS

DELINQUENT <sup>a</sup>				DELINQUENT AND NON-DELINQUENT							
AUTHORITY <sup>b</sup>	DATE OF INVESTIGATION <sup>c</sup>	DATE OF PUBLICATION <sup>c</sup>	TYPE OF GROUP AND COUNTRY	NO. OF CASES <sup>d</sup>	MEASURES		COEFFICIENT OF COLLIGATION <sup>e</sup>				
					DELINQUENCY	MENTAL INFERIORITY	NO. OF PERCENT-AGES POOLED <sup>f</sup>	PERCENTAGE MENTALLY INFERIOR			
								DELIN-QUENT	NON-DELIN-QUENT		
[Anon.] (5), Bowers (12), Fernald (36), Goddard (40), Goddard (42), Goddard (41), Malzberg (68), Murchison (78), Town (108), Wallin (116)	1912-1918	1900-1926	Adult Criminals United States	[22,665]	ESTIMATES OF MENTAL DEFICIENCY Classification as mentally deficient			15, 9	16.7	0.4	.75
Auden (8), East (33), Goring (45), Town (108), Tredgold (109), Wallin (117)	1902-1909	1907-1924	Great Britain and Ireland	[88,557]			24, 1	20.2	0.4		.78
Aschaffenburg (6), Bronner (15)		1889-1914	Germany	[1,619]			4, 2	12.0	1.1		.56

\* The footnotes to Table I will be found on page 81.

Berry (10), Wallace (114), Wallin (115), Wallin (117), Wümler (123)	1908-1924	Feeble-Minded Children in Public Schools	[11,441]	Classification as delinquent	10	11.4	1.3	.52
Ley (65)	1912	Belgium	300		1	96.3	14.4	.85 ± .03

TABLE I\* (Continued)

DELINQUENT*				DELINQUENT AND NON-DELINQUENT						
AUTHORITY <sup>b</sup>	DATE OF INVESTIGATION <sup>c</sup>	DATE OF PUBLICATION <sup>c</sup>	TYPE OF GROUP AND COUNTRY	NO. OF CASES <sup>d</sup>	MEASURES		COEFFICIENT OF COLLIGATION <sup>e</sup>			
					DELINQUENCY	MENTAL INFERIORITY	NO. OF PERCENT-AGES POOLED <sup>f</sup>	PERCENTAGE MENTALLY INFERIOR		P.E.s
								DELIN-QUENT	NON-DELIN-QUENT	
					Juvenile delinquency	Classification as mentally deficient	10, 6	27.8	2.2	.61
[Anon.] (5), Leeper (64), Pintner (88), Spaulding and Healy (100), Town (108), Williams (122)	1914-1923	1897-1925	United States	[7, 235]			4, 22	25.4	1.2	.68
Bronner (15), Tredgold (109), Wal- lin (116)	1912-1913	1908-1917	Great Britain	730			1, 2	26	1.4	.67
Lund (67)	1914	1918	Sweden	106			28, 2	25.7	1.1	.70
Grubbe (46), Weidensall (119)	1899-1910	1899-1913	Central Europe <sup>h</sup>	[10, 365]			8, 9	42.4	0.4	.86
Cobb (21), Gault (38), Goddard (40), Mertz (72), Terman (107)		1914-1919	United States	[7, 564]		Sex offense	11, 1	21.4	0.4	.78
Bronner (15), Cobb (21), Tredgold (109)	1902-1904	1914-1918	Great Britain	[17, 420]			4, 2	28.1	1.1	.71
Aeschaffenburg (6), Bronner (15)		1913-1914	Germany	566			6, 1	62.9	0.4	.91
			Alcoholics			Alcoholism				
Barnes (9), Bronner (15), Goring (45), Wallin (117)	1909	1908-1924	Great Britain	[9, 887]		Classification as mentally deficient				

## REPORTS OF EDUCATIONAL STATUS

## REPORTS OF ILLITERACY

		Adult Criminals	Adult criminality	Classification as illiterate					
Hill (52)	1923	1924	50, 677		1	5.6	7.1	-.06	$\pm .10$
Bowers (13), Bowers (12), Cleveland Foundation (20), Kernal, Hayes, and Dawley (35), Glueck (39), Hill (32), Resenquest (36), Spaulding (39), Stearns and Chapman (101), Steiner and Brown (102), Sutherland (104), United States Bureau of Labor (111)	1898-1926	1911-1927	[22, 664]		19	12.9	8.4	.12	
Villamor (113)	1870-1913		[8, 338]		3	62.1	51.4	.11	
Auden (8)	1911		[1, 000]		1	19	1.8	.56	$\pm .09$
Aschaffenburg (6)	1827-1877		[1, 000]		2	46.5	36.0	.11	
		Juvenile Delinquents		Juvenile delinquency					
Abbott and Breckinridge (1), United States Bureau of Education, Division of Statistics (110), United States Bureau of the Census (112)	1910-1923	1882-1927	69, 441		7	7.6	3.2	.22	
United States Bureau of Education, Division of Statistics (110)	1921-1922	1924	56		1	60.7	32.1	.29	$\pm .05$
Auden (8), Tredgold (109)	1908-1910	1908-1916	1, 206		2	4.4	1.8	.23	
Aschaffenburg (6)	1901-1908	1908-1913	[1, 000]		1	13.0	13.4	-.01	$\pm .07$
		Sex Offenders		Sex offense					
Bingham (11), Kneeland (59), Mertz (72), Wallin (116)	1913-1917	1913-1923	3, 039		6	12.5	10.0	.06	

\* The footnotes to Table I will be found on page 81.



Sex Offenders	Sex offense	Reaching Grade VI or below	3	43.2	25.0	.20
United States	810	REPORTS OF SCHOOL PROGRESS				
DATA WHICH TAKE INTO CONSIDERATION THE DIFFERENCE IN THE AGES OF THE PAIRED GROUPS						
Juvenile Delinquents	Juvenile delinquency					
United States	403	Mean retardation at each life age	3	78.7	37.3	.43
DATA WHICH DISREGARD THE DIFFERENCE IN THE AGES OF THE PAIRED GROUPS						
Adult Criminals	Adult criminality					
United States	365	Total retardation	1	70.7	61	.11 ± .05
Juvenile Delinquents	Juvenile delinquency					
United States	3,851 3,851 [671]	Retardation of 5 years or more Retardation of 4 years or more Total retardation	16 16 2	8.7 19.0 80.1	0.9 2.7 26.45	.53 .49 .54
Germany	229	Total retardation	2	58.2	50	.08
Sex Offenders	Sex offense					
United States	88	Total retardation	1	67	61	.07 ± .05
REPORTS OF EDUCATIONAL ACHIEVEMENT						
Juvenile Delinquents	Juvenile delinquency					
Great Britain	197	Testing below ratio of 85 on scholastic tests	1	59.9	15.7	.48 ± .04

\* The footnotes to Table I will be found on page 81.

TABLE I\* (Continued)

DELINQUENT <sup>a</sup>				DELINQUENT AND NON-DELINQUENT					
AUTHORITY <sup>b</sup>	DATE OF INVESTIGATION <sup>c</sup>	TYPE OF GROUP AND COUNTRY	NO. OF CASES <sup>d</sup>	MEASURES		COEFFICIENT OF COLLIGATION <sup>e</sup>			
				DELINQUENCY	MENTAL INFERIORITY	NO. OF PERCENT-AGES POOLED <sup>f</sup>	PERCENTAGE MENTALLY INFERIOR	ω	P.E.s
Miner (73), Pintner and Paterson (89), Wallin (116), Kelley (57), New York State Commission of Prisons (80), Williams (122)	1916-1919	RESULTS OF INTELLIGENCE TESTS							
		RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE							
		EARLIER RESULTS							
		Adult Criminals	United States	1,084	Adult criminality	8, 4	46.6	2.7	.70
				2,495		12, 2	23.2	0.7	.73
				2,882		14, 4	40.5	2.7	.66
				335		1, 4	30.2	2.7	.60
				835		4, 2	31.7	0.7	.78
		Juvenile Delinquents			Juvenile delinquency	22, 11	33.2	2.3	.64
		United States	5,500			16, 1	14.2	0.5	.70
		5,229			21, 11	35.3	2.3	.66	
		5,502							



	[3, 381]	Sex Offenders	Sex offense	7, 11	17.5	2.3	.50
Fernald, Hayes, and Dawley (35), Stoue (103)	1915- 1917	United States	Feeble-mindedness according to re- interpretation by Putner and Paterson	5, 1	31.1	0.5	.81
			Feeble-mindedness according to re- interpretation by Wallin				
			Feeble-mindedness according to re- port of original investigator	3, 4	57.6	2.7	.75
			Presumable deficiency according to reinterpretation by Miner	4, 2	34.2	0.7	.79
			Presumable or doubtful deficiency according to reinterpretation by Miner	3, 4	59.9	2.7	.76
Poull (91), Slavson (97), Williams (122)	1921- 1924	United States	Feeble-mindedness according to re- interpretation by Wallin	3, 2	27.5	0.7	.76
			Testing below 8-0 according to Stanford Revision of Binet- Simon Scale	3	1.1	0.7	.11
			Testing below 9-0 according to Stanford Revision of Binet- Simon Scale	3	6.45	4.1	.12
			Testing below 8-0 according to Stanford Revision of Binet- Simon Scale	3	5.0	0.6	.49
Maris (69)	1926	Canada	Testing below 9-0 according to Stanford Revision of Binet- Simon Scale	3	14.3	12.0	.05
			Testing below 9-0 according to Otis Group Intelligence Scale, Pri- mary and Advanced Examina- tions	1	18.9	4.8	.37 ± .03

## LATER RESULTS

## DATA WITH THE TEST RESULT EXPRESSED AS MENTAL AGE

## Adult criminality

## Juvenile delinquency

\* The footnotes to Table I will be found on page 81.



						DATA WITH THE TEST RESULT EXPRESSED AS AMOUNT OF OVERLAPPING							
						684							
Bridges and Bridges (14), Maris (66)	1925-1926	1926	Canada	684	Testing below 75 according to Kuhlmann Revision of Binet-Simon Tests	1	25	5	.43	±.07			
				1,543	Testing below 70 according to National Intelligence Tests, Scales A and B, combined	1	21.4	1	.68	±.09			
				86	Testing below 80 according to National Intelligence Tests, Form A	1	36.0	5.6	.51	±.06			
				[100]	Testing below 80 according to Otis Group Intelligence Scale, Primary and Advanced Examinations	1	29.5	5.6	.45	±.07			
Burt (16), Shrubsole (96)	1923-1925	1923-1925	Great Britain	197	Testing below 70 according to London Revision of Binet-Simon Scale	1	7.6	1.2	.44	±.13			
				100	Testing below 70 according to undesignated form of Binet-Simon scale	1	74.0	61.7	.14	±.05			
				100	Testing below 80 according to undesignated form of Binet-Simon scale	1	95.0	90.6	.17	±.09			
					Sex Offenders								
Minnesota State Board of Control, Division of Research (75)			United States	344	Testing below 75 according to Kuhlmann Revision of Binet-Simon Tests	1	24	5	.42	±.07			
					Sex offense								
Parlow and Haines (84), Slawson (97)	1921-1924	1919-1926	United States	307	Not reaching 2 percentile according to Group Intelligence Rating Tests, Form A and X	1	30.6	2	.65	±.07			
				571	Not reaching 5 percentile according to Group Intelligence Rating Tests, Form A and X	2	32.5	5	.50				
				1,445	Not reaching 50 percentile according to National Intelligence Tests, Scales A and B, combined	1	82.3	50	.37	±.05			
				86	Not reaching 50 percentile according to National Intelligence Tests, Form A	1	87	50	.44	±.05			
Bridges and Bridges (14)	1925	1926	Canada										

\*The footnotes to Table I will be found on page 81.



Asher (7), Slawson (97)	1921-1927	1926-1927	RESULTS OF TESTS OF MECHANICAL INTELLIGENCE		1,514	Reaching or exceeding norm on Thorndike Non-Verbal Test of Intelligence	1	32.6	50	*-.18 ±.05
			Juvenile Delinquents	Juvenile delinquency						
			United States		20			65	50	*.15 ±.05
					20			30	50	*-.21 ±.05
					104			49.0	50	*-.01 ±.05
					75			62.6	50	*.13 ±.05
					235			43.8	50	*-.06 ±.05

<sup>a</sup> In the case of both feeble-minded and delinquent groups certain corresponding data for the control groups will be found in the appropriate detailed tables of the tabular review of non-correlational studies of the relation between delinquency and mental inferiority, as presented in a separate monograph (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chaps. 2, 3, 4, 5).

by these authorities pursued by other investigators, are indicated for each type of evidence represented in the table in the corresponding detailed tables of the tabular review of non-correlational studies referred to in the preceding footnote.

<sup>c</sup> Since the date of investigation and the date of publication as given in the two columns of this table may at times appear inconsistent, it should be explained that the dates given in each case were taken from the detailed tables of the tabular review of non-correlational studies referred to above, and in addition information regarding the studies cited was made to supply the information in the instances in which it was not given in the original source.

<sup>d</sup> The numbers in brackets were supplied in whole or in part in accordance with a routine procedure, which required that a reasonable population be inferred from the nature of the data for the group in question in those instances in which the number of cases for a particular group was not given in the original source.

<sup>e</sup> Coefficients which indicate either a positive or a negative relation between delinquency and mental superiority rather than between delinquency and mental inferiority are preceded by an asterisk. In order to restrict consideration to the latter relationship, in subsequent discussion and in the compilation of correlational results such coefficients are interpreted as negative if positive and as positive if negative.

<sup>f</sup> The number of percentages pooled is identical for the experimental and the control groups except in the case of coefficients derived from data for paired types of groups rather than paired individual groups, that is, from data for Estimates of Mental Deficiency and Earlier Results of Tests of Verbal Abstract Intelligence. In these exceptional instances two numbers are given, referring to the number of percentages pooled for delinquent and for non-delinquent groups, respectively.

<sup>g</sup> Since the probable error formula used in the case of the coefficient of colligation is not designed for use with coefficients calculated from pooled percentages, probable errors are reported only for coefficients calculated from single percentages for delinquent groups paired with single percentages for non-delinquent groups.

<sup>h</sup> The countries included are Germany, Switzerland, and Austria-Hungary.

<sup>i</sup> It will be noted that the percentage reaching Grade II or below, which represents 14 percentages, is lower than the percentage reaching Grade I or below, which represents 9 percentages. This anomalous result is due to the fact that the members of the 5 delinquent groups represented in the percentage reaching Grade II or below which are not also represented in the percentage reaching Grade I or below apparently received on the average considerably less schooling than the members of the 9 delinquent groups represented in both percentages. A similar explanation applies in the case of the non-delinquent groups.

<sup>j</sup> The percentage reaching Grade III or below, which represents but 1 percentage, is identical only by chance with the percentage reaching Grade II or below, which represents 14 percentages.

An inspection of the individual coefficients given in the table discloses that eighty-nine of the ninety-five coefficients tabulated are positive.<sup>4</sup> Thus in every instance delinquency was found to be directly associated with mental inferiority in the feeble-minded groups investigated. Moreover, although instances in which delinquency was found to be inversely associated with mental inferiority in the delinquent groups investigated are to be noted in the second major division of the table in the studies reported by Hill for Adult Criminals, United States and Canada, and by Aschaffenburg for Juvenile Delinquents, Germany, in the case of Reports of Illiteracy, by Shrubsall for Adult Criminals, Great Britain, in the case of Later Results of Tests of Verbal Abstract Intelligence, and by Asher and by Slawson for Juvenile Delinquents, United States, in the case of Results of Tests of Mechanical Intelligence, these investigators without exception are also represented in the table<sup>5</sup> by data in which delinquency was found to be directly associated with mental inferiority.

An analysis of the coefficients for feeble-minded and delinquent groups, based upon a frequency distribution of the coefficients for the two major divisions of the table classified according to types of evidence,<sup>6</sup> may be interpreted briefly as follows:

- (1) In the case of coefficients calculated from data for paired feeble-minded and non-feeble-minded groups:

<sup>4</sup> In order to restrict consideration to the relation between delinquency and mental inferiority, throughout this interpretation coefficients preceded by an asterisk in Table I will be treated as negative if positive and as positive if negative.

<sup>5</sup> Since this point cannot be ascertained by consulting the table which is in process of interpretation, it may be noted that any investigators referred to above as offering evidence of an inverse relationship between delinquency and mental inferiority who are represented in the present table by results showing a direct relationship only in combination with other investigators, are represented individually by such data in the corresponding detailed tables of the original tabular review. The tables which must be consulted to establish this fact are Tables 5, 12, and 15 of the tabular review of non-correlational studies, as presented in the monograph reporting the comparative study and briefly described in Chapter IV.

<sup>6</sup> A frequency distribution of the coefficients included in Table I will be found in Appendix IV, Section 1.

The figures given in the interpretation which follows are the simple medians of all the coefficients represented in the distribution for the corresponding major divisions of the table, the signs of all coefficients preceded by an asterisk in the table having been changed to signify the relation between delinquency and mental inferiority.

The degree of association between delinquency and mental inferiority disclosed by coefficients of colligation obtained for feeble-minded groups varies from rather low to very high, centering about  $+.585$ ; and was found low, marked, or high in the case of Reports concerning Delinquency.

(2) In the case of coefficients calculated from data for paired delinquent and non-delinquent groups:

The degree of association between delinquency and mental inferiority disclosed by coefficients of colligation obtained for delinquent groups varies from somewhat marked and negative to extremely high and positive, centering about  $+.44$ ; and was found marked or high in the case of Estimates of Mental Deficiency; negligible but negative on the one hand, or negligible, low, or marked and positive on the other hand, in the case of Reports of Illiteracy; low in the case of Reports of Amount of Schooling; negligible, low, or marked in the case of Reports of School Progress; marked in the case of Reports of Educational Achievement; marked or low and negative on the one hand, or negligible, low, marked, or high and positive on the other hand, in the case of Results of Tests of Verbal Abstract Intelligence; negligible or low in the case of Results of Army Mental Tests; low or high in the case of Results of Tests of Non-Verbal Concrete Intelligence; and low and negative on the one hand, or negligible or low and positive on the other hand, in the case of Results of Tests of Mechanical Intelligence.

A critical examination of the coefficients represented in this analysis with reference to various factors which may affect the degree of relationship found, as the probable influence of these factors may be observed in the table or have already been considered at length in connection with the detailed interpretations of the basic tables presenting the data from which these coefficients were calculated,<sup>7</sup> discloses the following facts:<sup>8</sup>

<sup>7</sup> Of the factors subjected to analysis in this discussion, the first has application only to the coefficients of colligation obtained by the statistical reduction of the non-correlational studies, as presented in the table which is in process of interpretation, whereas the remaining factors are those which have already been enumerated in Chapter IV as influencing the findings for the various types of evidence for which data were summarized in the abridged review of these studies. As already stated, the detailed tables of the tabular review of non-correlational studies, from which the data summarized in the abridged review and statistically reduced by the calculation of the coefficients of colligation reported in the table were derived, will be found in a separate monograph. For a full understanding of the factors under consideration, therefore, the basic tables themselves and the accompanying interpretations as given in this monograph should be consulted (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chaps. 2, 3, 4, and 5).

<sup>8</sup> In calculating the difference between the contrasted results in the dis-

(1) A change in the type of subject utilized from paired feeble-minded and non-feeble-minded groups to paired delinquent and non-delinquent groups is involved in the studies reported in the two major divisions of the table. This change apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the difference between the median coefficients for these two divisions of the table is  $-.145$ .<sup>9</sup> Nevertheless, the fact that by the very nature of the case it is impossible to compare data for the same types of evidence and the same types of groups raises a question as to the significance of this finding.

(2) The use of variant standards of delinquency or of illiteracy has more or less general application to the studies reported but is not so important as at first appears in the case of Reports concerning Delinquency and Reports of Illiteracy. Taking the data as a whole, its effect upon the degree of relationship found may be disregarded for both types of evidence.

(3) The tendency of the more intelligent offender to escape detection as delinquent has general application to the studies reported and is of very great importance in the case of Reports concerning Delinquency. Its effect is to increase the degree of relationship found for the data as a whole for this type of evidence.

(4) The close supervision or artificial restraint of the feeble-minded has more or less general application to the studies reported but is of limited importance in the case of Reports concerning Delinquency. Its effect is to decrease the degree of relationship found for the data as a whole for this type of evidence.

(5) A difference in the ages of the paired groups is involved in the studies reported by Anderson, by Farrell, by Miner, and by Smith for Feeble-Minded Persons at Large in Community, United States, by Merrill for Feeble-Minded Persons in Institutions, United States, and by Wallin for Feeble-Minded Persons in Institutions, Great Britain, in the case of Reports concerning Delinquency; in the studies reported by Rosenquest and by the United States Bureau of Labor for Adult Criminals, United States, by Abbott and Breckinridge for Juvenile Delinquents, United States, by Auden and by Tredgold for Juvenile Delinquents, Great Britain, and by Bingham for Sex Offenders, United States, in the case of Reports of Illiteracy; in the studies reported by Drucker, by the United States Bureau of the Census (first entry), by Clark, by Doll, by Mathews, by Ordahl, by Otis, by Partlow and Haines, by the United States

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cussion of the first factor, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease in the degree of relationship, the proper sign being prefixed. Similarly, in referring to an increase or a decrease in the degree of relationship found in the discussion of the remaining factors, the same scale was taken as the basis.

<sup>9</sup>The contrasted median coefficients, as given in the foregoing brief interpretation, are  $+.585$  and  $+.44$ , respectively.



Bureau of the Census (second entry), by Williams, by Abbott and Breckinridge, by Cornell, by Cowdery, by Poull, and by Wallace for Juvenile Delinquents, United States, by Gruhle for Juvenile Delinquents, Germany, and by Weidensall and by Kammerer for Sex Offenders, United States, in the case of Reports of Amount of Schooling; in the studies reported by Stone for Adult Criminals, United States, and by Poull, by Slawson, and by Williams for Juvenile Delinquents, United States, in the first division of the data, in the studies reported by Stone and by the Minnesota State Board of Control for Adult Criminals, United States, by the Tasmania State Psychological Clinic for Adult Criminals, Australia, by Healy and Bronner, by Williams, by the Minnesota State Board of Control, and by Slawson for Juvenile Delinquents, United States, and by the Minnesota State Board of Control for Sex Offenders, United States, in the second division of the data, and in the studies reported by Partlow and Haines and by Slawson for Juvenile Delinquents, United States, in the third division of the data, in the case of Later Results of Tests of Verbal Abstract Intelligence; in the study reported by Anderson for Juvenile Delinquents, United States, in the case of Results of Army Mental Tests; and in the study reported by Partlow and Haines for Juvenile Delinquents, United States, in the case of Results of Tests of Non-Verbal Concrete Intelligence; moreover, the difference in the ages of the paired groups has practically general application to the studies reported and is of great importance in the case of Reports of School Progress. Its effect is to increase the degree of relationship found in seven instances of comparison for the first type of evidence; is to decrease this degree of relationship in one instance of comparison, is negligible with respect to it in four instances, and is to increase it in one instance for the second type of evidence; is to decrease this degree of relationship in seventeen instances of comparison and to increase it in four instances for the third type of evidence; is to decrease this degree of relationship in four instances of comparison and is negligible with respect to it in twenty-two instances for the fourth type of evidence; is to increase this degree of relationship in two instances of comparison for the fifth type of evidence; is negligible with respect to this degree of relationship in one instance of comparison for the sixth type of evidence; and is to increase this degree of relationship for the data as a whole for the seventh type of evidence.

(6) The use of varying standards of mental or of intellectual deficiency has general application to the studies reported but is not so important as at first appears in the case of Estimates of Mental Deficiency and Earlier Results of Tests of Verbal Abstract Intelligence. In a consideration of the data as a whole its effect upon the degree of relationship found may be disregarded for both types of evidence.

(7) The marked or partial subjectivity of the data has general

application to the studies reported and is of very great importance in the case of Estimates of Mental Deficiency and Earlier Results of Tests of Verbal Abstract Intelligence. Its effect is to increase the degree of relationship found for the data as a whole for both types of evidence.

(8) The use of different methods of obtaining information regarding illiteracy has fairly general application to the studies reported but is not of great importance in the case of Reports of Illiteracy. Its effect is to increase the degree of relationship found for the data as a whole for this type of evidence.

(9) The opportunity frequently afforded delinquents for formal instruction after detention has only somewhat general application to the studies reported and is of limited importance in the case of Reports of Illiteracy. Its effect is to decrease the degree of relationship found for the data as a whole for this type of evidence.

(10) A geographical disparity in the data for the paired groups is involved in the study reported by Hill for Adult Criminals, United States and Canada, in the case of Reports of Illiteracy; in the studies reported by Murchison, by Fernald, Hayes, and Dawley, by the Missouri Association for Criminal Justice, by Ordahl, by Rosenquest, and by Spaulding for Adult Criminals, United States, and by Drucker for Juvenile Delinquents, United States, in the case of Reports of Amount of Schooling; in the studies reported by Fernald, Hayes, and Dawley and by Stone for Adult Criminals, United States, by Slawson for Juvenile Delinquents, United States, and by Maris for Juvenile Delinquents, Canada, in the first division of the data, in the study reported by the Tasmania State Psychological Clinic for Adult Criminals, Australia, in the second division of the data, and in the study reported by Bridges and Bridges for Juvenile Delinquents, Canada, in the third division of the data, in the case of Later Results of Tests of Verbal Abstract Intelligence; and in the studies reported by Adler and Worthington, by Hamill, and by Weber and Guilford for Adult Criminals, United States, and by Anderson for Juvenile Delinquents, United States, in the case of Results of Army Mental Tests. Its effect is negligible with respect to the degree of relationship found in one instance of comparison for the first type of evidence; is to decrease this degree of relationship in eight instances of comparison and to increase it in four instances for the second type of evidence; is to decrease this degree of relationship in eight instances of comparison and to increase it in three instances for the third type of evidence; and is negligible with respect to this degree of relationship in five instances of comparison and is to decrease it in two instances for the fourth type of evidence.

(11) A serious discrepancy in the periods covered by the data for the paired groups is involved in the study reported by Villamor for Adult Criminals, Philippine Islands, in the case of Reports of

Illiteracy. Its effect is to increase the degree of relationship found in one instance of comparison for this type of evidence.

(12) An unrepresentative intelligence distribution for one or both of the paired groups is involved in the studies reported by Auden for Adult Criminals, Great Britain, by Auden and by Tredgold for Juvenile Delinquents, Great Britain, and by Wallin for Alcoholics, Great Britain, in the case of Reports of Illiteracy; in the study reported by the National Academy of Sciences for Adult Criminals, United States, in the case of Reports of Amount of Schooling; in the studies reported by Shrubsall for Adult Criminals, Great Britain, and also for Juvenile Delinquents, Great Britain, in the second division of the data in the case of Later Results of Tests of Verbal Abstract Intelligence; in the study reported by the National Academy of Sciences for Adult Criminals, United States, in the case of Results of Army Mental Tests; and in the study reported by Slawson (second entry) for Juvenile Delinquents, United States, in the case of Results of Tests of Mechanical Intelligence. Its effect is to increase the degree of relationship found in four instances of comparison for the first type of evidence; is to decrease this degree of relationship in two instances of comparison for the second type of evidence; is to decrease this degree of relationship in four instances of comparison for the third type of evidence; is to decrease this degree of relationship in four instances of comparison for the fourth type of evidence; and is negligible with respect to this degree of relationship in one instance of comparison for the fifth type of evidence.

(13) The lock-step system of promotion has general application to the studies reported and is of great importance in the case of Reports of Amount of Schooling and Reports of School Progress. Its effect is to decrease the degree of relationship found for the data as a whole for the two types of evidence.

(14) A difference in the racial composition of the paired groups is involved in the studies reported by the National Academy of Sciences, by the Missouri Association for Criminal Justice, by Ordahl, and by Spaulding for Adult Criminals, United States, by Drucker for Juvenile Delinquents, United States, and by Bingham and by Kammerer for Sex Offenders, United States, in the case of Reports of Amount of Schooling; in the study reported by Fernald, Hayes, and Dawley for Adult Criminals, United States, in the case of Reports of School Progress; in the studies reported by Stone for Adult Criminals, United States, by Poull and by Williams for Juvenile Delinquents, United States, and by Maris for Juvenile Delinquents, Canada, in the first division of the data, in the studies reported by Stone for Adult Criminals, United States, and by Healy and Bronner, by Williams, and by Slawson for Juvenile Delinquents, United States, and by Maris for Juvenile Delinquents, Canada, in the second division of the data, and in the study reported

by Slawson for Juvenile Delinquents, United States, in the third division of the data, in the case of Later Results of Tests of Verbal Abstract Intelligence; in the studies reported by Doll, by Hamill, and by Murchison for Adult Criminals, United States, in the case of Results of Army Mental Tests; and in the study reported by Slawson (third entry) for Juvenile Delinquents, United States, in the case of Results of Tests of Mechanical Intelligence. Its effect is to increase the degree of relationship found in ten instances of comparison for the first type of evidence; is to increase this degree of relationship in one instance of comparison for the second type of evidence; is to increase this degree of relationship in seventeen instances of comparison for the third type of evidence; is to increase this degree of relationship in two instances of comparison and to decrease it in twelve instances for the fourth type of evidence; and is negligible with respect to this degree of relationship in one instance of comparison for the fifth type of evidence.

(15) The method of expressing the test result has general application to the studies reported and appears to be of some importance in the case of Later Results of Tests of Verbal Abstract Intelligence. In a consideration of the data as a whole its effect upon the degree of relationship found may be disregarded for this type of evidence.

(16) The type of test employed has general application to the studies reported but does not appear to be of much importance in the case of Later Results of Tests of Verbal Abstract Intelligence, although it is probably of considerable importance in the case of Results of Tests of Non-Verbal Concrete Intelligence and Results of Tests of Mechanical Intelligence. In a consideration of the data as a whole its effect upon the degree of relationship found may be disregarded for the first type of evidence, and likewise for the third type of evidence; on the other hand, since only picture tests are represented in the data under consideration for the second type of evidence, its effect cannot be determined with certainty, although under the circumstances indicated it may be assumed to be to increase the degree of relationship found for this type of evidence.

(17) A serious lack of uniformity in the step intervals used in expressing the test result for the paired groups is involved in the studies reported by Poull and by Williams for Juvenile Delinquents, United States, in the first division of the data in the case of Later Results of Tests of Verbal Abstract Intelligence. Its effect is to increase the degree of relationship found in four instances of comparison for this type of evidence.

(18) An inequality in the social status of the paired groups is involved in the studies reported by Bridges and Bridges and by Maris for Juvenile Delinquents, Canada, in the second division of the data in the case of Later Results of Tests of Verbal Abstract

Intelligence. Its effect is to increase the degree of relationship found in two instances of comparison for this type of evidence.

In appraising the correlational results in process of interpretation in the light of the eighteen factors considered, it should be noted that the first factor is apparently noteworthy in effect as far as the two divisions of the data are concerned, and, although no opportunity is provided for establishing this finding, offers some confirmation of the importance of the type of subject utilized; whereas all but three of the remaining factors apparently exercise an influence which should not be disregarded upon one or more types of evidence. Accordingly, in an evaluation of the data as a whole it may possibly be inferred that, in conformity with the first factor, a higher degree of relationship between delinquency and mental inferiority is characteristic of feeble-minded groups than of delinquent groups; while it is necessary to keep in mind that, as the combined result of the remaining factors, the degree of relationship between delinquency and mental inferiority revealed by the various types of evidence is probably considerably too high in the case of Reports concerning Delinquency, very much too high in the case of Estimates of Mental Deficiency, a fairly accurate representation in the case of Reports of Illiteracy, considerably too low in the case of Reports of Amount of Schooling, a fairly accurate representation in the case of Reports of School Progress, and also in the case of Reports of Educational Achievement, very much too high in the case of Earlier Results of Tests of Verbal Abstract Intelligence, somewhat too high in the case of Later Results of Tests of Verbal Abstract Intelligence, somewhat too low in the case of Results of Army Mental Tests, somewhat too high in the case of Results of Tests of Non-Verbal Concrete Intelligence, and a fairly accurate representation in the case of Results of Tests of Mechanical Intelligence.

A consideration of the magnitude of the coefficients represented in the analysis in relation to their probable errors (if reported)<sup>10</sup> gives the following information:

<sup>10</sup> It will be recalled that probable errors were reported in the case of coefficients of colligation obtained by the statistical reduction of the non-correlational studies only for those coefficients which were calculated from individual rather than pooled percentages.

Since coefficients calculated from pooled percentages, frequently representing a number of different studies, other things being equal, may be assumed to be more significant than coefficients calculated from individual

(1) Probable errors are reported for 41 of the 95 coefficients under consideration.

(2) Of these coefficients, 22 are at least four times their probable errors, 6 are at least three times their probable errors, 4 are at least twice their probable errors, and 9 are less than twice their probable errors, in magnitude.

(3) The total range of the 22 coefficients which are at least four times their probable errors is from .21 to .88, and the range of 14 of these coefficients, from .42 to .68.<sup>11</sup>

It will be noted that fourteen of the twenty-two coefficients which are shown by the data under consideration to be sufficiently reliable to be taken as a dependable indication of real relationship point to a marked degree of positive correlation between delinquency and mental inferiority. This finding gains in importance, moreover, because of the fact that nearly three-fourths of the relationships which may be regarded as satisfactorily established<sup>12</sup> represent four of the most objective types of evidence considered in the research.

In summary, then, it may be said that coefficients of colligation between measures of delinquency and mental inferiority obtained by the statistical reduction of the non-correlational studies point to a direct relation between morality and intellect which, although somewhat variable, tends to be marked in feeble-minded groups, and, although extremely variable, likewise tends to be marked in delinquent groups, in this country and abroad. At the same time, a critical examination of the coefficients with reference to various factors apparently indicates on the one hand that the degree of relationship is affected by the type of subjects utilized, and, although the finding is not established, is possibly higher in feeble-minded than in delinquent groups; and on the other hand,

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percentages, in spite of the fact that no probable errors are reported in such circumstances it is evident that the present discussion leaves out of consideration some of the most important relationships found. For information regarding these relationships the table itself should be consulted.

<sup>11</sup> Since certain of the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>12</sup> The proportion given represents 3 out of 4 coefficients showing a low degree, 11 out of 14 coefficients showing a marked degree, and 2 out of 4 coefficients showing a high degree of positive correlation included among the 22 coefficients which meet the standard of reliability formulated above.

by reason of the combined effect of the remaining factors considered, that the degree of relationship revealed by the several types of evidence is probably too high in the case of Reports concerning Delinquency, Estimates of Mental Deficiency, Earlier and Later Results of Tests of Verbal Abstract Intelligence, and Results of Tests of Non-Verbal Concrete Intelligence, too low in the case of Reports of Amount of Schooling and Results of Army Mental Tests, and fairly accurate in the case of Reports of Illiteracy, Reports of School Progress, Reports of Educational Achievement, and Results of Tests of Mechanical Intelligence. A consideration of the magnitude of the coefficients in relation to their probable errors, however, serves to emphasize the finding of a marked degree of relationship between the qualities investigated.

## SECTION 2

### COEFFICIENTS OF COLLIGATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY REPORTED IN THE LITERATURE

Table II presents coefficients of colligation between measures of delinquency and mental inferiority reported in the literature.

The table contains the routine information required in a tabular review of correlational studies in delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case simply the coefficient of colligation itself.

The major and minor types of evidence as to the relation between delinquency and mental inferiority contributed by the data tabulated are as follows:

REPORTS OF EDUCATIONAL STATUS: Reports of Educational Achievement.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Tests of Non-Verbal Concrete Intelligence.

The following type of group is represented by the studies reviewed in the table:

DELINQUENT GROUPS: Juvenile Delinquents.

TABLE II  
COEFFICIENTS OF COLLIGATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY  
REPORTED IN THE LITERATURE

DELINQUENT <sup>a</sup>				DELINQUENT AND NON-DELINQUENT			
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF COLLIGATION $\omega$
					DELINQUENCY	MENTAL INFERIORITY	
London County Council (66, pp. 185-188) Burt		1922	JUVENILE DELINQUENTS <i>Great Britain</i>  Representative juvenile delinquents inspected at industrial schools and places of detention of County Council, and miscellaneous cases submitted for psychological examination by teachers, magistrates, and secretaries of colonies for delinquent children, London Delinquents of school age	REPORTS OF EDUCATIONAL STATUS  REPORTS OF EDUCATIONAL ACHIEVEMENT			.71
Slawson (97, pp. III, 75-77, 127, 132-133, 138, 155-162)	1921-1924	1926	JUVENILE DELINQUENTS <i>United States</i>  Male juvenile delinquents, New York State <sup>b</sup>  Delinquent boys, New York House of Refuge, State Agricultural and Industrial School, and Hawthorne School	RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE			.74

COEFFICIENT  
OF  
COLLIGATION $\omega$ 

.71

.74

.60

.41

.37



Burt (16, pp. 11, 17-18, 47, 51-53, 281-282, 581, fn.)	1923	White delinquent boys 16 years of age or over, New York House of Refuge <i>Great Britain</i>	385	Institutional boyhood delinquency	Stanford-Binet mental age below 10 When social status is considered <sup>c</sup> When social status is not considered <sup>d</sup>	.12 .62
London County Council (86, pp. 185-188) Burt	1922	Consecutive cases of juvenile delinquency from 5 to 17 years of age, inclusive, selected to form fair representative sample of ordinary city delinquent, London	197 <sup>e</sup>	Juvenile delinquency	Psychological conditions; Intellectual (excluding supernormal ability)	.41
		Representative juvenile delinquents inspected at industrial schools and places of detention of County Council, and miscellaneous cases submitted for psychological examination by teachers, magistrates, and secretaries of colonies for delinquent children, London	107	Juvenile delinquency	Mental deficiency as indicated by mental ratio less than 70	.33
		Delinquents of school age	57	Juvenile delinquency	Mental backwardness as indicated by mental ratio less than 85	.31
RESULTS OF TESTS OF NON-VERBAL CONCRETE INTELLIGENCE						
JUVENILE DELINQUENTS						
United States						
Slawson (97, pp. 111, 75-77, 161-162)	1921-1924	Male juvenile delinquents, New York State <sup>f</sup>	1,420	Institutional boyhood delinquency for ages 9 to 18 years, inclusive	Poorer than median performance on Thorndike Non-Verbal Test	.18

<sup>a</sup> Certain corresponding data for the control groups will be found in the original studies.

<sup>b</sup> The institutions included were the New York House of Refuge, the State Agricultural and Industrial School, the Berkshire Industrial Farm, and the Hawthorne School. "In order to include the Berkshire Industrial Farm boys . . . the Stanford-Binet mental ages at this institution were transmuted into National Test scores," since the latter test had not been given there. (Cf. 97, pp. 37, 157-158.)

<sup>c</sup> The percentage for non-delinquents used in the comparison was that for the white Army draft (cf. 97, pp. 127, 132).

<sup>d</sup> The percentage for non-delinquents used in the comparison was that for the unselected population as given by Terman, the criterion in this instance actually being 11 years, 2 months, however, rather than 10 years, the criterion in the case of the delinquent group (cf. 97, p. 132).

<sup>e</sup> The number tabulated included 123 boys and 74 girls (cf. 16, p. 11, fn.).

<sup>f</sup> The institutions included were the New York House of Refuge, the State Agricultural and Industrial School, and the Hawthorne School (cf. 97, p. 75).

The following countries are likewise represented by the studies reviewed in the table:

DELINQUENT GROUPS: United States, Great Britain.

The coefficients of colligation between measures of delinquency and mental inferiority reported in the literature presented in Table II afford wholly consistent evidence of a direct association between morality and intellect.

An inspection of the individual coefficients given in the table discloses that the eleven coefficients tabulated are all positive. Thus in every instance delinquency was found to be directly associated with mental inferiority in the delinquent groups investigated.

An analysis of the coefficients for delinquent groups, based upon a frequency distribution of the coefficients for the table as a whole classified according to types of evidence,<sup>13</sup> may be interpreted briefly as follows:

The degree of association between delinquency and mental inferiority disclosed by coefficients of colligation reported for delinquent groups varies from very low to fairly high, centering about  $+0.41$ ; and was found high in the case of Reports of Educational Achievement; low or marked in the case of Results of Tests of Verbal Abstract Intelligence; and low in the case of Results of Tests of Non-Verbal Concrete Intelligence.

A critical examination of the coefficients represented in this analysis with reference to various factors which may affect the degree of relationship found discloses the following facts:<sup>14</sup>

(1) A change in the measure of mental inferiority from a less inclusive to a more inclusive standard is involved in the results reported by the London County Council for Juvenile Delinquents, Great Britain, in the case of Reports of Educational Achievement and Results of Tests of Verbal Abstract Intelligence, and certain results reported by Slawson<sup>15</sup> for Juvenile Delinquents, United

<sup>13</sup> A frequency distribution of the coefficients included in Table II will be found in Appendix IV, Section 1.

The figure given in the interpretation which follows is the simple median of all the coefficients represented in this distribution.

<sup>14</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed. For more than one series of results the simple median of these differences is reported.

<sup>15</sup> The results in question are for mental age on National Intelligence Tests, Scales A and B, combined, below 9-9 and below 11-2.

States, in the case of Results of Tests of Verbal Abstract Intelligence. This change apparently has an indifferent effect upon the degree of relationship, since the median difference between the contrasted coefficients is only  $-.02$ , the second of these coefficients being lower than the first for two of the three series of results and higher than the first for one series. Nevertheless, the lessened restriction in range resulting from the more inclusive standard for an identical group, represented by the third series of results, would presumably show a higher degree of relationship, which does not prove to be the case in this instance; whereas the lessened restriction in range resulting from the more inclusive standard for a group which is at the same time restricted in respect to chronological age, represented by the first two series of results, would have an uncertain effect upon the degree of relationship found, possibly accounting for the very slight differences and the ambiguous turn of the contrasted coefficients in these two instances. It is of interest to note, however, that the expectation that an increase in the size of the coefficient would accompany a lessened restriction in range is fulfilled by data somewhat similar in character reported by Miner in Table IV.

(2) A change in the comparative data utilized providing for an equalization of the social status of the groups concerned is involved in certain results reported by Slawson<sup>19</sup> for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence. This change appears to be accompanied by an extraordinary decrease in the degree of relationship, since the difference between the contrasted coefficients is  $-.50$  for the one series of results. Nevertheless, the fact that the comparative data utilized in the two instances were not comparable nor wholly satisfactory in other respects raises a question as to the significance of this finding.

In appraising the correlational results in process of interpretation in the light of the two factors considered, it should be noted that one of these factors fails to show a noteworthy effect, and that the other factor, although apparently of some importance in the case of the data affected, fails to suggest the influence of any constant error upon the particular type of evidence involved. Accordingly, in an evaluation of the data as a whole it is probably safe to overlook their effect.

In summary, then, it may be said that coefficients of colligation between measures of delinquency and mental inferiority reported

<sup>19</sup> The results in question are for Stanford-Binet mental age below 10 when social status is considered and when social status is not considered, the order of the coefficients as treated in the discussion being reversed from that given in the table to permit a more direct method of statement.

in the literature point to a direct relation between morality and intellect which, although decidedly variable, tends to be marked in delinquent groups in English-speaking countries. At the same time, a critical examination of the coefficients with reference to various factors apparently indicates that the degree of relationship revealed by the several types of evidence does not require qualification as a result of their effect.

### SECTION 3

#### CORRELATION RATIOS BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY

Table III presents correlation ratios between measures of delinquency and mental inferiority.

The table contains the routine information required in a tabular review of correlational studies in delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case the relation, the correlation ratio, with its probable error if reported, and the regression.

The major and minor types of evidence as to the relation between delinquency and mental inferiority contributed by the data tabulated are as follows:

##### ESTIMATES OF MENTAL DEFICIENCY.

REPORTS OF EDUCATIONAL STATUS: Reports of Amount of Schooling.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence.

The following types of groups are represented by the studies reviewed in the table:

DELINQUENT GROUPS: Adult Criminals, Juvenile Delinquents, Sex Offenders.

The following countries are likewise represented by the studies reviewed in the table:

DELINQUENT GROUPS: United States, Great Britain.

The correlation ratios between measures of delinquency and mental inferiority presented in Table III afford fairly inconsistent

evidence of a positive correlation between morality and intellect.

An inspection of the individual coefficients given in the table discloses that fourteen of the twenty-eight coefficients tabulated show a positive relation, ten a varying relation, and four a negative relation, and that accordingly only fourteen of the eighteen most significant results given<sup>17</sup> may be classed as positive.<sup>18</sup> Nevertheless, although instances in which delinquency was found to be inversely correlated with mental inferiority in the delinquent groups investigated are to be noted in the studies reported by Goring for Adult Criminals, Great Britain, in the case of Estimates of Mental Deficiency, and also in the case of Reports of Amount of Schooling, and by Fernald, Hayes, and Dawley for Adult Criminals, United States, in the case of Results of Tests of Verbal Abstract Intelligence, these investigators are also represented in the table by data in which delinquency was found to be directly correlated with mental inferiority.

An analysis of the coefficients for delinquent groups, based upon a frequency distribution of the most significant coefficients for the table as a whole classified according to types of evidence,<sup>19</sup> may be interpreted briefly as follows:

The degree of correlation between delinquency and mental inferiority disclosed by correlation ratios reported for delinquent groups varies from very low and negative to decidedly marked and positive, centering about  $+.19$ ; and was found low and negative on the one hand, or low or marked and positive on the other hand, in the case of Estimates of Mental Deficiency; low and negative in the case of Reports of Amount of Schooling; and low or negligible but negative on the one hand, or negligible or low and positive on the other hand, in the case of Results of Tests of Verbal Abstract Intelligence.

<sup>17</sup> Comprising the coefficients showing either a positive or a negative relation.

<sup>18</sup> In order to restrict consideration to the relation between delinquency and mental inferiority, throughout this interpretation coefficients preceded by an asterisk in Table III will be treated as negative if positive and as positive if negative.

<sup>19</sup> A frequency distribution of the most significant coefficients included in Table III (comprising the coefficients showing either a positive or a negative relation) will be found in Appendix IV, Section 1.

The figure given in the interpretation which follows is the simple median of all the coefficients represented in this distribution, the signs of all coefficients preceded by an asterisk in the table having been changed to signify the relation between delinquency and mental inferiority.

TABLE III \*  
CORRELATION RATIOS BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY

DELINQUENT									
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		CORRELATION RATIO <sup>a</sup>		
					DELINQUENCY	MENTAL INFERIORITY	RELATION <sup>b</sup>	r	P. E.
					ESTIMATES OF MENTAL DEFICIENCY				
			ADULT CRIMINALS						
			<i>Great Britain</i>						
Goring (45, pp. 6, 39, 47, 74, fn., 82, 181, fn., 235-241, 243-247, 255, 267-271, 285-286, 376-377, 401-402, 423)	1902-1907	1913	Convicts, Parkhurst Prison <sup>c</sup>	997	Nature of crime	Estimated general intelligence	*—	.45	Intelligence with nature of crime
				499	Nature of crime	Estimated general intelligence	*—	.49	Intelligence with nature of crime
				785	Nature of crime	Estimated general intelligence	*—	.65	Unspecified
				785	Average annual number of reports for misdemeanor	Estimated general intelligence	*—	.33	Unspecified
			Halfinal criminals among convicts indicted for serious offenses who had been so frequently convicted as to receive eventually penal servitude sentence	514	Average frequency of conviction per year of freedom	Estimated general intelligence	*—	.20	Intelligence upon convictions
			English convicts	515	Average fraction of every year spent in prison	Estimated general intelligence	*+	.12	Intelligence upon imprisonment
				1,496	Nature of crime	Estimated general intelligence	*—	.46	Crime with intelligence
			REPORTS OF EDUCATIONAL STATUS						
			REPORTS OF AMOUNT OF SCHOOLING						
			ADULT CRIMINALS						
			<i>United States</i>						
Fernald, Hayes, and Dawley (35, pp. 7, 284-287)	1915-1917	1920	Women delinquents, New York State	439 452	Nature of present offense Number of previous convictions	Grade finished in school	~ ~ ~	.23 .11 .16	Unspecified Grade finished on number of previous convictions Number of previous convictions on grade finished

<i>Great Britain</i>			RESULTS OF INTELLIGENCE TESTS					Frequency of conviction with school
1902-1907	1913	Habitual criminals among convicts indicted for serious offenses who had been so frequently convicted as to receive eventually penal servitude sentence, Parkhurst Prison *	513	Average frequency of conviction per year of freedom	Type of school education received	~	.11	
			513	Average fraction of every year spent in prison	Type of school education received	*+	.15	
RESULTS OF VERBAL ABSTRACT INTELLIGENCE*								
ADULT CRIMINALS								
<i>United States</i>								
Fernald, Hayes, and Dawley (35, pp. 7, 435-437, 460-461, 464-467, 472-475, 480-488, 514-515)	1915-1917	Women delinquents, New York State English-speaking cases	520	Type of sentence	Test aggregate†	~	.17 ± .04	
			375	Nature of present offense	Test aggregate	~	.23 ± .05	
			374	Number of previous convictions	Test aggregate	*—	.18 ± .05	
			373	Number of months served in penal institutions	Test aggregate	*+	.14 ± .05	
						*+	.16 ± .05	
			372	Nature of first offense	Test aggregate	~	.10 ± .05	
			374	First sentence	Test aggregate	~	.20 ± .05	
			381	Degree of alcoholism	Test aggregate	*—	.20 ± .05	
			374	Degree of sexual irregularity	Test aggregate	*—	.04 ± .05	
						*—	.14 ± .05	
JUVENILE DELINQUENTS								
<i>United States</i>								
Slawson (97, pp. iii, 185-186, 188-189)	1921-1924	Delinquent boys, New York House of Refuge	553	Number of arrests	Stanford-Binet mental age	~	.15 ± .03	
			553	Severity of delinquent career	Stanford-Binet mental age	~	.16 ± .03	

\* The footnotes to Table III will be found on page 100.

TABLE III (Concluded)

AUTHORITY	DATE OF INVESTIGATION	GROUP	No. OF CASES	MEASURES		CORRELATION RATIO <sup>a</sup>		
				DELINQUENCY	MENTAL INFERIORITY	RELATION <sup>b</sup>	P.E.	REGRESSION
Fernald, Hayes, and Dawley (35, pp. 7, 516-517, 519, 521-522)	1915-1917	SEX OFFENDERS United States English-speaking women delinquents who had been sexually irregular, New York State Prostitutes	261	Sum of years sexually irregular	Test aggregate <sup>c</sup>	*—	.16 ± .06	Sum of years sexually irregular on test aggregate
				Number of years in prostitution	Test aggregate	*—	.20 ± .06	Test aggregate on sum of years sexually irregular
			190			*—	.26 ± .07	Years in prostitution on test aggregate
						*—	.27 ± .07	Test aggregate on years in prostitution

<sup>a</sup> Coefficients which indicate either a positive or a negative relation between delinquency and mental superiority rather than between delinquency and mental inferiority are preceded by an asterisk. In order to resist consideration to the latter relationship, in subsequent discussion and in the compilation of correlational results such coefficients are interpreted as negative if positive and as positive if negative.

<sup>b</sup> The type of relation is indicated as follows: positive, by a plus sign (+); varying, by a tilde (~); and negative, by a minus sign (—).

<sup>c</sup> In the compilation of correlational results only the correlation ratios calculated from data showing either a positive or a negative relation are included.

<sup>d</sup> The population at Parkhurst prison . . . is very heterogeneous compared with that at other stations. Parkhurst is the station for the weak-minded, the epileptic, the insane, the tubercular, the diseased generally; there is also a large population of star-class convicts at Parkhurst; and all the Jews are located there." (45, p. 74, fn.)

<sup>e</sup> These data were classified in this section of the table because 86 per cent of the cases were included in categories relating to amount of schooling.

<sup>f</sup> Or tests principally of this type. See the succeeding footnote.

<sup>g</sup> The term *test aggregate* as used in this table refers to an average of the standings on the following four series of tests (or on three if only three were available): the Yerkes-Bridges Point Scale, the Stanford Revision of the Binet-Simon Scale, a group of language tests, and a group of performance tests (cf. 35, pp. 56-58).



A critical examination of the coefficients represented in this analysis<sup>20</sup> with reference to various factors which may affect the degree of relationship found discloses the following facts:<sup>21</sup>

(1) A change in the measure of delinquency from the nature of the offense to the tendency toward misconduct is involved in certain results reported by Goring<sup>22</sup> for Adult Criminals, Great Britain, in the case of Estimates of Mental Deficiency. This change appears to be accompanied by a decided decrease in the degree of relationship, since the difference between the contrasted coefficients is  $-.32^{23}$  for the one series of results. It should be added that a lower degree of relationship for the tendency toward misconduct as compared with the nature of the offense is also to be noted in the case of identical data subjected to a different method of correlation reported by Goring in Table IV.

(2) A change in the measure of delinquency from the degree of recidivism to the length of imprisonment is involved in certain results reported by Goring<sup>24</sup> for Adult Criminals, Great Britain, in

<sup>20</sup> Since coefficients showing a varying relation are excluded from the analysis interpreted above, they are likewise excluded from the present critical examination. Persons who wish to subject these coefficients to a similar examination will find data as follows:

(1) A change in the measure of delinquency from the nature of the offense to the degree of recidivism is involved in certain results reported by Fernald, Hayes, and Dawley for Adult Criminals, United States, in the case of Reports of Amount of Schooling and Results of Tests of Verbal Abstract Intelligence, the results in question being for nature of present offense and number of previous convictions.

(2) A change in the measure of delinquency from the degree of recidivism to the length of imprisonment is involved in the results reported by Goring for Adult Criminals, Great Britain, in the case of Reports of Amount of Schooling.

(3) A change in the measure of delinquency from the degree of recidivism to the seriousness of delinquency is involved in the results reported by Slawson for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence.

<sup>21</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease in the degree of relationship, the proper sign being prefixed. For two series of results the simple mean of these differences is reported.

<sup>22</sup> The results in question are for nature of crime and average annual number of reports for misdemeanor for a group of 785 cases.

<sup>23</sup> Since the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>24</sup> The results in question are for average frequency of conviction per year of freedom and average fraction of every year spent in prison.

the case of Estimates of Mental Deficiency, and certain results reported by Fernald, Hayes, and Dawley<sup>25</sup> for Adult Criminals, United States, in the case of Results of Tests of Verbal Abstract Intelligence. This change apparently tends to be accompanied by a decided decrease in the degree of relationship, since the mean difference between the contrasted coefficients is  $-.33$ ,<sup>26</sup> the second of these coefficients being lower than the first for the two series of results.<sup>27</sup> It should be added that a lower degree of relationship for the length of imprisonment as compared with the degree of recidivism is also to be noted in the case of identical or similar data subjected to a different method of correlation reported by Goring in Table IV, and in the case of identical data subjected to a different method of correlation reported by Fernald, Hayes, and Dawley in Table VI.

In appraising the correlational results in process of interpretation in the light of the two factors considered, it should be noted that these factors, although apparently of some importance in the case of the data affected, fail to suggest the influence of any constant errors upon the particular types of evidence involved. Accordingly, in an evaluation of the data as a whole it is probably safe to overlook their effect.

A consideration of the magnitude of the coefficients represented in the analysis in relation to their probable errors (if reported)<sup>28</sup> gives the following information:

- (1) Probable errors are reported for 12 of the 18 coefficients under consideration.
- (2) Of these coefficients, 2 are at least four times their probable errors, 5 are at least three times their probable errors, 4 are at least

<sup>25</sup> The results in question are for number of previous convictions and number of months served in penal institutions, the particular regressions used being test aggregate on number of previous convictions and test aggregate on number of months served in penal institutions, in order to correspond as nearly as possible to the results reported by Goring.

<sup>26</sup> Since the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>27</sup> It will be noted that a change in the type of relation is involved in both instances.

<sup>28</sup> Since coefficients showing a varying type of relation were excluded from the analysis, they are likewise excluded from the present consideration. It may be noted, however, that probable errors are reported for 9 of the 10 coefficients in question, and that 7 of these 10 coefficients are at least four times their probable errors, 1 is at least three times its probable error, and 1 is at least twice its probable error, in magnitude.

twice their probable errors, and 1 is less than twice its probable error, in magnitude.

(3) The 2 coefficients which are at least four times their probable errors are .45 and .49, respectively.<sup>20</sup>

It will be noted that the two coefficients which are shown by the data under consideration to be sufficiently reliable to be taken as a dependable indication of real relationship point to a marked degree of positive correlation between delinquency and mental inferiority. This finding loses in importance, however, because of the fact that the relationships which may be regarded as satisfactorily established represent one of the least objective types of evidence considered in the research.

In summary, then, it may be said that correlation ratios between measures of delinquency and mental inferiority point to a direct relation between morality and intellect which, although decidedly variable, tends to be low in delinquent groups in English-speaking countries. At the same time, a critical examination of the coefficients with reference to various factors apparently indicates that the degree of relationship revealed by the several types of evidence does not require qualification as a result of their effect. A consideration of the magnitude of the coefficients in relation to their probable errors, however, points to a marked degree of relationship between the qualities investigated.

#### SECTION 4

##### TETRACHORIC COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY

Table IV presents tetrachoric coefficients of correlation between measures of delinquency and mental inferiority.

The table has two major divisions, which serve to differentiate the various coefficients according to the type of comparative data utilized. These major divisions are designated as follows:

- A. Calculated from Data for Criminals and the Non-Criminal Community.
- B. Calculated from Data for Criminals Committing Different Kinds of Crime.



RESULTS OF INTELLIGENCE TESTS  
RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE

RESULTS OF INTELLIGENCE TESTS							
RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE							
JUVENILE DELINQUENTS							
United States							
Miner (73, pp. 220-223)	1915	1918	Boys from 8 to 16 years of age who had become delinquent for first time during year specified, <sup>a</sup> summoned before Juvenile Court of Hennepin County, Minneapolis, Minn.	272	Juvenile delinquency <sup>a</sup>	Testing below borderline which represents lowest 0.5 per cent of population of corresponding ages <sup>b</sup>	.16 ± .07
				272	Juvenile delinquency <sup>a</sup>	Testing below borderline which represents lowest 1.5 per cent of population of corresponding ages <sup>b</sup>	.29 ± .05

## B. CALCULATED FROM DATA FOR CRIMINALS COMMITTING DIFFERENT KINDS OF CRIME

## DELINQUENT

AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF CORRELATIONS*				
							DELINQUENCY	MENTAL INFERIORITY			
									ZERO ORDER	FIRST ORDER	
								$r_t$	P. E.	$r_{12.3}$	P. E.
ADULT CRIMINALS											
Great Britain											
Goring (45, pp. 6, 39, 74, fn., 181, fn. 237, 239-241, 243-247, 250, 255, 267-271, 277, 286-287, 289, 291, 298, 320-321, 331, 333, 341-343, 377, 401-402, 405, 416, 423)	1902-1907	1913	Convicts, Parkhurst Prison <sup>b</sup>	785	Nature of crime	Estimated general intelligence	*-.52				
Habitual criminals among convicts indicted for serious offenses who had been so frequently convicted as to receive eventually penal servitude sentence				785	Average annual number of reports for misdemeanor	Estimated general intelligence	*-.31				$\pm .07$
				514	Average frequency of conviction per year of freedom	Estimated general intelligence	*-.16				$\pm .03$
				515	Average fraction of every year spent in prison	Estimated general intelligence	*.10				$\pm .03$
				347	Alcoholism	Estimated general intelligence	*-.14				

\* The footnotes to Table IV will be found on page 107.

TABLE IV (Concluded)

DELINQUENT										
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF CORRELATIONS			
					DELINQUENCY	MENTAL INFERIORITY	ZERO ORDER		FIRST ORDER	
							$r_t$	P. E.	$r_{12.3}$	P. E.
Goring (Cont.)			Criminals generally English convicts	1,496	Alcoholism Alcoholism	Mental grade Estimated general intelligence	.39 *-.23			
			Criminals found in convict prisons who had not been previously convicted	697	Intemperance	Estimated weak-minded- ness	.12	±.03		
			Criminals found in convict prisons who had been convicted and imprisoned	998	Intemperance	Estimated weak-minded- ness	.09	±.02		
			at least once prior to present sentence	998	Number of previous convictions	Estimated weak-minded- ness	.22	±.02		
	REPORTS OF EDUCATIONAL STATUS									
REPORTS OF AMOUNT OF SCHOOLING										
ADULT CRIMINALS										
Great Britain										
Goring (45, pp. 6, 39, 181, fn., 237, 239, 241, fn., 245, 255, 267-271, 274-275, 287, 341-343, 414)	1902-1907	1913	Habitual criminals among convicts indicted for serious offenses who had been so frequently convicted as to receive eventually penal servitude sentence, Parkhurst Prison <sup>b</sup>	428	Average frequency of conviction per year of freedom	Standard reached on leaving school	*-.03	±.03	*.06 <sup>b</sup>	±.03
				428	Average fraction of every year spent in prison	Standard reached on leaving school	*.10	±.03	*.06 <sup>b</sup>	±.03

## REPORTS OF EDUCATIONAL ACHIEVEMENT

Goring (45, pp. 6, 39, 181, fn., 239, 241, fn., 245, 255, 267-271, 275-276, 287, 341-343, 414-415)	1913	1902-1907	ADULT CRIMINALS <i>Great Britain</i>  Habitual criminals among convicts indicted for serious offenses who had been so frequently convicted as to receive eventually penal servitude sentence, Parkhurst Prison <sup>b</sup>	502	Average frequency of conviction per year of freedom  Average fraction of every year spent in prison	Grade of education apportioned by schoolmaster on reception into prison  Grade of education apportioned by schoolmaster on reception into prison	* .06  * .15	± .03  ± .03	* .14 <sup>b</sup>  * .12 <sup>b</sup>	± .03  ± .03

<sup>a</sup> Certain corresponding data for the control groups will be found in the original studies.

<sup>b</sup> "The population at Parkhurst prison . . . is very heterogeneous compared with that at other stations. Parkhurst is the station for the weak-minded, the epileptic, the insane, the tubercular, the diseased generally; there is also a large population of star-class convicts at Parkhurst; and all the Jews are located there." (45, p. 74, fn.)

<sup>c</sup> Since the station at Parkhurst had been utilized since 1904 for the segregation of officially designated weak-minded convicts, the percentage mentally defective was reduced to the figure for total convicts received at all stations (cf. 45, pp. 254-255).

<sup>d</sup> The number of repeaters and the proportion of delinquent cases dismissed at the hearing were subtracted from the total number of new cases (cf. 73, p. 222).

<sup>e</sup> The proportion of juvenile delinquents for the year specified was assumed to be typical for a series of years, an assumption justified by a comparison of the figures for this year with those for the preceding 4 years (cf. 73, p. 221).

<sup>f</sup> The frequency of tested deficiency was assumed to correspond within this limit to the frequency found in a group of consecutive cases at the Glen Lake Farm School for Boys, this estimate appearing to be liberal from a comparison of the indices for the amount of school retardation in the two groups (cf. 73, pp. 122, 221).

<sup>g</sup> Coefficients which indicate either a positive or a negative relation between delinquency and mental superiority rather than between delinquency and mental inferiority are preceded by an asterisk. In order to restrict consideration to the latter relationship, in subsequent discussion and in the compilation of correlational results such coefficients are interpreted as negative if positive and as positive if negative.

<sup>h</sup> The variable held constant is intelligence.

These two divisions of the table contain the routine information required in a tabular review of correlational studies in delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in the first division of the table simply the tetrachoric coefficient of correlation, with its probable error if reported; and in the second division of the table the zero order tetrachoric and certain corresponding first order coefficients of correlation, with their probable errors if reported.

The major and minor types of evidence as to the relation between delinquency and mental inferiority contributed by the data tabulated are as follows:

ESTIMATES OF MENTAL DEFICIENCY.

REPORTS OF EDUCATIONAL STATUS: Reports of Amount of Schooling, Reports of Educational Achievement.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence.

The following types of groups are represented by the studies reviewed in the table:

DELINQUENT GROUPS: Adult Criminals, Juvenile Delinquents.

The following countries are likewise represented by the studies reviewed in the table:

DELINQUENT GROUPS: United States, Great Britain.

The tetrachoric coefficients of correlation between measures of delinquency and mental inferiority presented in Table IV afford fairly consistent evidence of a positive correlation between morality and intellect.

An inspection of the individual coefficients given in the table discloses that twenty of the twenty-four zero order coefficients<sup>29</sup> tabulated are positive.<sup>30</sup> Moreover, although instances in which delinquency was found to be inversely associated with mental inferiority in the delinquent groups investigated are to be noted

<sup>29</sup> It will be recognized that, although circumstances did not require the designation of the coefficients in the first major division of the table as zero order coefficients, they are as truly such as the coefficients so designated in the second major division of the table.

<sup>30</sup> In order to restrict consideration to the relation between delinquency and mental inferiority, throughout this interpretation coefficients preceded by an asterisk in Table IV will be treated as negative if positive and as positive if negative.



in the second major division of the table in the studies reported by Goring for Adult Criminals, Great Britain, in the case of Estimates of Mental Deficiency, Reports of Amount of Schooling, and Reports of Educational Achievement, this investigator is also represented in the table by data in which delinquency was found to be directly associated with mental inferiority.

An analysis of the coefficients for delinquent groups, based upon a frequency distribution of the zero order coefficients for the two major divisions of the table classified according to types of evidence,<sup>31</sup> may be interpreted briefly as follows:

(1) In the case of coefficients calculated from data for criminals and the non-criminal community:

The degree of correlation between delinquency and mental inferiority disclosed by tetrachoric coefficients of correlation reported for delinquent groups varies from very low to fairly high, centering about  $+.525$ ; and was found low, marked, or high in the case of Estimates of Mental Deficiency; and low in the case of Results of Tests of Verbal Abstract Intelligence.

(2) In the case of coefficients calculated from data for criminals committing different kinds of crime:

The degree of correlation between delinquency and mental inferiority disclosed by tetrachoric coefficients of correlation reported for delinquent groups varies from very low and negative to well marked and positive, centering about  $+.13$ ; and was found negligible but negative on the one hand, or negligible, low, or marked and positive on the other hand, in the case of Estimates of Mental Deficiency; negligible and either negative or positive in the case of Reports of Amount of Schooling; and low or negligible but negative in the case of Reports of Educational Achievement.

A critical examination of the coefficients represented in this analysis with reference to various factors which may affect the degree of relationship found discloses the following facts:<sup>32</sup>

<sup>31</sup> A frequency distribution of the zero order coefficients included in Table IV will be found in Appendix IV, Section 1.

The figures given in the interpretation which follows are the simple medians of all the coefficients represented in the distributions for the corresponding major divisions of the table, the signs of all coefficients preceded by an asterisk in the table having been changed to signify the relation between delinquency and mental inferiority.

<sup>32</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease and a higher result as an increase

(1) A change in the comparative data utilized providing for the substitution for data for criminals and the non-criminal community of data for criminals committing different kinds of crime is involved in the studies reported in the two major divisions of the table. This change apparently tends to be accompanied by a decided decrease in the degree of relationship, since the difference between the median coefficients for these two divisions of the table is  $-.395$ .<sup>33</sup> Moreover, the fact that a comparison of the coefficients for the same type of evidence, the same type of group, the same country, the same authority, and in considerable measure the same individual group, represented by certain results reported by Goring<sup>34</sup> for Adult Criminals, Great Britain, in the two divisions of the table in the case of Estimates of Mental Deficiency, shows a difference of  $-.27$  between the contrasted results<sup>35</sup> lends support to this finding. It is apparent that this finding is of considerable interest, since it suggests that the relatively high degree of relationship found in the case of the results reported in the first division of the table, evidently mainly as a result of the magnitude of the coefficients tabulated for Estimates of Mental Deficiency, is due in part at least to the marked subjectivity of the data, affecting the estimate of mental defectiveness among criminals in comparison with the non-criminal community.

(2) A change in the measure of delinquency from conviction for criminality in general to conviction for a specific type of offense is involved in the results reported by Goring for Adult Criminals, Great Britain, in the case of Estimates of Mental Deficiency. This

in the degree of relationship, the proper sign being prefixed. For more than one series of results the simple median of these differences is reported.

<sup>33</sup> The contrasted median coefficients, as given in the foregoing brief interpretation, are .525 and .13, respectively.

<sup>34</sup> The results in question are for conviction for any kind of criminal offense correlated with estimated mental defectiveness, estimate for delinquent group being based upon assumed proportion of unclassified weak-minded prisoners in addition to number of prisoners officially designated weak-minded, in the first major division of the table, and for nature of crime correlated with estimated general intelligence, in the second major division.

<sup>35</sup> The contrasted coefficients, as given in Table IV, are .79 and .52, the sign of the latter coefficient having been changed to correspond with the relationship under investigation. The difference thus shown, however, is a maximum, since either one of two other coefficients reported by Goring, namely, .66 and .63, for conviction for any kind of criminal offense and for conviction for felony, correlated in each case with estimated mental defectiveness, estimate for delinquent group being based upon number of prisoners officially designated weak-minded, might have been used in the comparison. If the mean of the three appropriate coefficients in the first major division of the table be compared with the appropriate coefficient in the second major division of the table, the difference between the contrasted results is reduced from  $-.27$  to  $-.17$ . Notwithstanding, the finding would appear to be of some significance.

change apparently tends to be accompanied by a noticeable decrease in the degree of relationship, since the difference between the contrasted mean coefficients is  $-.24$  for the one series of results. Nevertheless, the fact that one of the five coefficients of the second type is higher than two of the three contrasted coefficients raises a question as to the genuineness of this finding.

(3) A change in the measure of mental inferiority from a less inclusive to a more inclusive standard is involved in the results reported by Miner for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence. This change appears to be accompanied by an appreciable increase in the degree of relationship, since the difference between the contrasted coefficients is  $+.13$  for the one series of results. Moreover, the fact that the chances are 84 in 100 that the true difference is greater than zero<sup>36</sup> gives some reason for confidence in the genuineness of this finding. At the same time, the lessened restriction in range resulting from the more inclusive standard for an identical group would presumably show the higher degree of relationship found in this instance. It should be noted, however, that the expectation that an increase in the size of the coefficient would accompany a lessened restriction in range is not fulfilled by data somewhat similar in character reported by Slawson in Table II, and is fulfilled in only one of two instances by data also somewhat similar in character, but with an opposing type of restriction in range complicating the issue, reported by the London County Council in the table indicated.

(4) A change in the measure of delinquency from the nature of the offense to the tendency toward misconduct is involved in certain results reported by Goring<sup>37</sup> for Adult Criminals, Great Britain, in the case of Estimates of Mental Deficiency. This change appears to be accompanied by a noticeable decrease in the degree of relationship, since the difference between the contrasted coefficients is  $-.21$ <sup>38</sup> for the one series of results. It should be added that a lower degree of relationship for the tendency toward misconduct as compared with the nature of the offense is also to be noted in the case of identical data subjected to a different method of correlation reported by Goring in Table III.

(5) A change in the measure of delinquency from the degree of

<sup>36</sup> This follows from the fact that  $\frac{D}{P.E.diff.} = 1.44$ .

<sup>37</sup> The results in question are for nature of crime and average annual number of reports for misdemeanor.

<sup>38</sup> Since the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

recidivism to the length of imprisonment is involved in certain results reported by Goring<sup>39</sup> for Adult Criminals, Great Britain, in the case of Estimates of Mental Deficiency, Reports of Amount of Schooling, and Reports of Educational Achievement. This change apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.13$ ,<sup>40</sup> the second of these coefficients being consistently lower than the first for the three series of results.<sup>41</sup> It should be added that a lower degree of relationship for the length of imprisonment as compared with the degree of recidivism is also to be noted in the case of certain identical data subjected to a different method of correlation reported by Goring and data of a similar character reported by Fernald, Hayes, and Dawley in Table III, and in the case of the corresponding data reported by Fernald, Hayes, and Dawley in Table VI.

In appraising the correlational results in process of interpretation in the light of the five factors considered, it should be noted that the first factor is apparently noteworthy in effect as far as the two divisions of the data are concerned, and, because of the apparent effect of the marked subjectivity of the data in the case of one of the types of evidence represented when comparison is made with the non-criminal community, offers significant confirmation of the importance of the type of comparative data utilized; whereas the remaining factors, although apparently of some importance in the case of the data affected, fail to suggest the influence of any constant errors upon the particular types of evidence involved. Accordingly, in an evaluation of the data as a whole it is probably safe to overlook the effect of all but one of these factors, but it is necessary to keep in mind that, as a result of the first factor, the degree of relationship between delinquency and mental inferiority revealed by the type of evidence in question for the first division of the data is probably considerably too high in the case of Estimates of Mental Deficiency.

A consideration of the magnitude of the coefficients represented

<sup>39</sup> The results in question are for average frequency of conviction per year of freedom and average fraction of every year spent in prison.

<sup>40</sup> Since the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>41</sup> It will be noted that a change in the type of relation is involved in two instances.

in the analysis in relation to their probable errors (if reported) gives the following information:

(1) Probable errors are reported for 12 of the 24 coefficients under consideration.

(2) Of these coefficients, 7 are at least four times their probable errors, 2 are at least three times their probable errors, 2 are at least twice their probable errors, and 1 is less than twice its probable error, in magnitude.

(3) The total range of the 7 coefficients which are at least four times their probable errors is from  $-.15$  to  $+.31$ , and the range of 5 of these coefficients, from  $+.12$  to  $+.31$ .<sup>42</sup>

It will be noted that five of the seven coefficients which are shown by the data under consideration to be sufficiently reliable to be taken as a dependable indication of real relationship point to a low degree of positive correlation between delinquency and mental inferiority. This finding would scarcely be anticipated in view of the fact that nearly three-fourths of the relationships which may be regarded as satisfactorily established<sup>43</sup> represent one of the least objective types of evidence considered in the research.

A comparison between the zero order and the corresponding first order coefficients of correlation in the four instances in which the latter are reported reveals additional facts of interest, as follows:<sup>40</sup>

(1) In the case of Reports of Amount of Schooling, for Adult Criminals, Great Britain, coefficients of  $+.03$  and  $-.10$ , representing the correlations of average frequency of conviction per year of freedom and average fraction of every year spent in prison with standard reached on leaving school, reported by Goring, become  $-.06$  in both cases if intelligence is held constant.

(2) In the case of Reports of Educational Achievement, for Adult Criminals, Great Britain, coefficients of  $-.06$  and  $-.15$ , representing the correlations of average frequency of conviction per year of freedom and average fraction of every year spent in prison with grade of education apportioned by schoolmaster on re-

<sup>42</sup> Since certain of the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>43</sup> The proportion given represents the 1 coefficient showing a negligible degree and 4 of the 5 coefficients showing a low degree of positive correlation included among the 7 coefficients which meet the standard of reliability formulated above.

ception into prison, reported by Goring, become  $-.14$  and  $-.12$ , respectively, if intelligence is held constant.

Although the facts presented in the foregoing comparison are too meager to permit the formulation of definite conclusions, particularly in view of the fact that only one of the zero order coefficients under consideration and only two of the four first order coefficients tabulated are as much as four times their probable errors in magnitude, they suggest the indirect effect upon the degree of correlation of factors which the usual type of correlational analysis fails to take into account.

In summary, then, it may be said that tetrachoric coefficients of correlation between measures of delinquency and mental inferiority point to a direct relation between morality and intellect which, although extremely variable, tends to be low in delinquent groups in English-speaking countries. At the same time, a critical examination of the coefficients with reference to various factors apparently indicates on the one hand that the degree of relationship is affected by the type of comparative data utilized, and, by reason of the marked subjectivity of the data implicit in the type of evidence in question, is probably too high for one division of the data in the case of Estimates of Mental Deficiency; but on the other hand that the degree of relationship revealed by the other types of evidence does not require qualification as a result of the effect of the remaining factors considered. Furthermore, a consideration of the magnitude of the coefficients in relation to their probable errors serves to emphasize the finding of a low degree of direct relationship between the qualities investigated. It should be noted, however, that a comparison between the zero order and the corresponding first order coefficients of correlation suggests the indirect effect upon the degree of correlation of factors not usually considered.

## SECTION 5

### RANK-DIFFERENCE COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY

Table V presents rank-difference coefficients of correlation between measures of delinquency and mental inferiority.

The table contains the routine information required in a tabular review of correlational studies in delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case simply the rank-difference coefficient of correlation itself.

The major and minor types of evidence as to the relation between delinquency and mental inferiority contributed by the data tabulated are as follows:

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Tests of Non-Verbal Concrete Intelligence.

The following type of group is represented by the study reviewed in the table:

DELINQUENT GROUPS: Juvenile Delinquents.

The following country is likewise represented by the study reviewed in the table:

DELINQUENT GROUPS: United States.

The rank-difference coefficients of correlation between measures of delinquency and mental inferiority presented in Table V afford very inconsistent evidence of a positive correlation between morality and intellect.

An inspection of the individual coefficients given in the table discloses that only two of the three coefficients tabulated are positive. Nevertheless, although an instance in which delinquency was found to be inversely associated with mental inferiority in the delinquent groups investigated is to be noted in the study reported by Chassell for Juvenile Delinquents, United States, in the case of Results of Tests of Non-Verbal Concrete Intelligence, this investigator is also represented in the table by data in which delinquency was found to be directly associated with mental inferiority.

An analysis of the coefficients for delinquent groups for the table as a whole, classified according to types of evidence,<sup>44</sup> may be interpreted briefly as follows:

<sup>44</sup> A frequency distribution of the coefficients included in Table V will be found in Appendix IV, Section 1.

The figure given in the interpretation which follows is the simple median of all the coefficients represented in this distribution.

TABLE V  
RANK-DIFFERENCE COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY

DELINQUENT							COEFFICIENT OF CORRELATION
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		
					DELINQUENCY	MENTAL INFERIORITY	
C. F. Chasell (Appendix I, Section 1)	1914	1935	JUVENILE DELINQUENTS <i>United States</i>	13	RESULTS OF INTELLIGENCE TESTS  RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE		
			Mentally and morally abnormal type cases described by Healy who had been tested by Binet scale		Rank in morality based on group assignments made by 4 experts, editor, and writer as to relative degree of delinquency revealed by case studies, and on further consideration of cases by writer	Rank in mentality based on intelligence quotient as determined by Binet scale	
C. F. Chasell (Appendix I, Section 1)	1914	1935	JUVENILE DELINQUENTS <i>United States</i>	48 <sup>b</sup> 13	RESULTS OF TESTS OF NON-VERBAL CONCRETE INTELLIGENCE		
			Mentally and morally abnormal type cases <sup>a</sup> and additional typical juvenile court case described by Healy Mentally and morally abnormal type cases who had been tested by Binet scale		Rank in morality based on group assignments made by 4 experts, editor, and writer as to relative degree of delinquency revealed by case studies, and on further consideration of cases by writer	Rank in mentality based on average grade on Healy tests <sup>c</sup>	
							-.02
							.24

<sup>a</sup> Two such cases were excluded owing to the fact that one of these had been given the Binet tests only, and the other, no tests whatever (cf. Appendix I, Section 1).

<sup>b</sup> Of this number 30 were boys and 18 were girls (cf. Appendix I, Section 1).

<sup>c</sup> The classification of the Healy tests as non-verbal is based on the predominant type of test, since a number of different abilities are measured by the tests (cf. 51, pp. 11-50).



The degree of correlation between delinquency and mental inferiority disclosed by rank-difference coefficients of correlation reported for delinquent groups varies from practically negligible but negative to rather low and positive, centering about  $+.24$ ; and was found low in the case of Results of Tests of Verbal Abstract Intelligence; and negligible but negative on the one hand, or low and positive on the other hand, in the case of Results of Tests of Non-Verbal Concrete Intelligence.

A critical examination of the coefficients represented in this analysis with reference to any factors which may affect the degree of relationship found discloses the following facts:<sup>45</sup>

A change in the subjects used from a total group to a particular sub-group is involved in the results reported by Chassell for Juvenile Delinquents, United States, in the case of Results of Tests of Non-Verbal Concrete Intelligence. Such a change apparently may have a noticeable effect upon the degree of relationship, since the difference between the contrasted coefficients is  $+.26$  for the one series of results.<sup>46</sup> Nevertheless, a satisfactory explanation of this increase in the degree of relationship is not afforded by the data tabulated.<sup>47</sup>

In appraising the correlational results in the light of the one factor considered, it should be noted that this factor, although apparently of some importance in the case of the data affected, fails to suggest the influence of any constant error upon the particular type of evidence involved. Accordingly, in an evaluation of the data as a whole it is probably safe to overlook its effect. At the same time, it should be recognized that the small number of coefficients tabulated makes it necessary to regard the findings as tentative only.

In summary, then, it may be said that rank-difference coefficients of correlation between measures of delinquency and mental inferiority point to a direct relation between morality and intellect which, although somewhat variable, tends to be low in delinquent

<sup>45</sup> In calculating the difference between the contrasted results in this discussion, a higher result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as an increase in the degree of relationship, the proper sign being prefixed.

<sup>46</sup> It will be noted that a change in the type of relation is involved in this instance.

<sup>47</sup> Moreover, in the monograph by Healy (48), which describes all but one of the cases used as subjects in the study reported by Chassell, a satisfactory explanation is not to be found, since the basis of selection for the type cases who had been tested by the Binet Scale, constituting the particular sub-group under consideration, is not stated. It is possible, however, that an important element in the selection was suspected mental deficiency.

groups in this country. At the same time, a critical examination of the coefficients with reference to the one factor applicable apparently indicates that the degree of relationship revealed by the two types of evidence does not require qualification as a result of its effect. It should be recognized, however, that the small number of coefficients tabulated makes it necessary to regard the findings as tentative only.

## SECTION 6

### PRODUCT-MOMENT COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY

Table VI presents product-moment coefficients of correlation between measures of delinquency and mental inferiority.

The table contains the routine information required in a tabular review of correlational studies in delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case the zero order product-moment and certain corresponding first order coefficients of correlation, with their probable errors if reported.

The major and minor types of evidence as to the relation between delinquency and mental inferiority contributed by the data tabulated are as follows:

REPORTS OF EDUCATIONAL STATUS: Reports of Amount of Schooling.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Tests of Non-Verbal Concrete Intelligence, Results of Tests of Mechanical Intelligence.

The following types of groups are represented by the studies reviewed in the table:

DELINQUENT GROUPS: Adult Criminals, Juvenile Delinquents, Sex Offenders.

The following country is likewise represented by the studies reviewed in the table:

DELINQUENT GROUPS: United States.

The product-moment coefficients of correlation between measures of delinquency and mental inferiority presented in Table VI

afford very inconsistent evidence of a positive correlation between morality and intellect.

An inspection of the individual coefficients given in the table discloses that only twenty-three of the thirty-seven zero order coefficients tabulated are positive.<sup>48</sup> Nevertheless, although instances in which delinquency was found to be inversely associated with mental inferiority in the delinquent groups investigated are to be noted in the studies reported by Fernald, Hayes, and Dawley for Adult Criminals, United States, and by Clark, by Cushing and Ruch, and by Slawson for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence, and by Slawson for Juvenile Delinquents, United States, in the case of Results of Tests of Non-Verbal Concrete Intelligence, and also in the case of Results of Tests of Mechanical Intelligence, these investigators without exception are also represented in the table by data in which delinquency was found to be directly associated with mental inferiority.

An analysis of the coefficients for delinquent groups, based upon a frequency distribution of the zero order coefficients for the table as a whole classified according to types of evidence,<sup>49</sup> may be interpreted briefly as follows:

The degree of correlation between delinquency and mental inferiority disclosed by product-moment coefficients of correlation reported for delinquent groups varies from somewhat marked and negative to rather low and positive, centering about  $+.04$ ; and was found negligible but positive in the case of Reports of Amount of Schooling; marked, low, or negligible but negative on the one hand, or negligible or low and positive on the other hand, in the case of Results of Tests of Verbal Abstract Intelligence; low or negligible but negative on the one hand, or negligible but positive on the other hand, in the case of Results of Tests of Non-Verbal Concrete Intelligence; and marked or negligible but negative on the one hand, or negligible but positive on the other hand, in the case of Results of Tests of Mechanical Intelligence.

<sup>48</sup> In order to restrict consideration to the relation between delinquency and mental inferiority, throughout this interpretation coefficients preceded by an asterisk in Table VI will be treated as negative if positive and as positive if negative.

<sup>49</sup> A frequency distribution of the zero order coefficients included in Table VI will be found in Appendix IV, Section 1.

The figure given in the interpretation which follows is the simple median of all the coefficients represented in this distribution, the signs of all coefficients preceded by an asterisk in the table having been changed to signify the relation between delinquency and mental inferiority.

TABLE VI\*  
PRODUCT-MOMENT COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF DELINQUENCY AND MENTAL INFERIORITY

DELINQUENT							
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	MEASURES		COEFFICIENT OF CORRELATION <sup>a</sup>	
				No. OF CASES	MENTAL INFERIORITY	ZERO ORDER	
						r	P.E.

			143	Improvement in responses	Stanford-Binet intelligence quotient	-.12	± .06
Cushing and Rueh (28, pp. 1-6)	1925	1927		Length of commitment to institution	Otis Advanced Intelligence Examination, Form B, mental age	* .09	
				Scores on tests of character traits <sup>b</sup> Testimony (Suggestibility) False Book Titles Overstatement Choice of Girl Companions Choice of Boy Companions Social Attitudes Offense Rating Psychopathic Questionnaire	Otis Advanced Intelligence Examination, Form B, mental age	-.50 <sup>c</sup> *-.03 *-.09 *-.30 *-.34 *-.33 *-.38 -.15 <sup>c</sup>	
Laslett (63, pp. 226-227)	1925	1925	86	Delinquency test score	Stanford Revision intelligence quotient	.02	
			49	Delinquency test score	Stanford Revision mental age	.07	± .10
Raubenhelmer (92, pp. 56-57, 59, 95)	1925	1925	42	Score on Character-Behavior Tests	National Intelligence Tests, Form B, Scale 2, mental age	.21	± .15
Shawson (97, pp. iii, 182-188)	1921-1924	1926	553	Number of arrests	Stanford-Binet test score	*-.05	± .03
			553	Severity of delinquent career	Stanford-Binet test score	*-.02	± .03
			513	Number of arrests	National A+B test score	*-.04	± .03
			513	Severity of delinquent career	National A+B test score	*-.04	± .03
			309	Number of arrests	National A+B test score	*-.09	± .04
			309	Severity of delinquent career	National A+B test score	* .13	± .04
				SEX OFFENDERS			
				United States			
Fernald, Hayes, and Dawley (35, pp. 7, 516-517, 519, 521)	1915-1917	1920	261	Sum of years sexually irregular	Test aggregate <sup>e</sup>	*-.13	± .06
			190	Number of years in prostitution	Test aggregate	*-.21	± .07

\* The footnotes to Table VI will be found on page 123.





A critical examination of the coefficients represented in this analysis with reference to various factors which may affect the degree of relationship found discloses the following facts:<sup>50</sup>

(1) A change in the measure of delinquency from the degree of recidivism to the length of imprisonment is involved in the results reported by Fernald, Hayes, and Dawley for Adult Criminals, United States, in the case of Results of Tests of Verbal Abstract Intelligence. This change appears to be accompanied by an appreciable decrease in the degree of relationship, since the difference between the contrasted coefficients is  $-.14$ <sup>51</sup> for the one series of results.<sup>52</sup> Moreover, the fact that the chances are 91 in 100 that the true difference is greater than zero<sup>53</sup> gives considerable reason for confidence in the genuineness of this finding. It should be added that a lower degree of relationship for the length of imprisonment as compared with the degree of recidivism is also to be noted in the case of data of a similar character reported by Goring and identical data subjected to a different method of correlation reported by Fernald, Hayes, and Dawley in Table III, and in the case of data of a similar character reported by Goring in Table IV.

(2) A change in the method of expressing the test result from mental age to intelligence quotient is involved in the results reported by Clark<sup>54</sup> and the results reported by Laslett<sup>55</sup> for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence. This change apparently tends to be accompanied by a slight decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.05$ , the

<sup>50</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed. For more than one series of results the simple median (or mean) of these differences is reported.

<sup>51</sup> Since the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>52</sup> It will be noted that a change in the type of relation is involved in this instance.

<sup>53</sup> This follows from the fact that  $\frac{D}{P.E.diff.} = 2.0$ .

<sup>54</sup> A slight difference in wording in the name of one of the response items used as a measure of delinquency for the contrasted results is overlooked in this comparison.

<sup>55</sup> For the purposes of this discussion the order of the coefficients reported by Laslett has been changed from that given in the table to conform with the order of the corresponding coefficients reported by Clark.



second of these coefficients being consistently lower than the first for the three series of results.<sup>66</sup>

(3) A difference in the objective test employed as the measure of delinquency is involved in the results reported by Cushing and Ruch for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence. The particular test employed apparently may have an extraordinary effect upon the degree of relationship, since the total range of the eight coefficients in the series, representing eight tests of character traits, is .88,<sup>67</sup> the range of the seven highest coefficients, on the other hand, being only .35.<sup>68</sup>

(4) A change in the measure of delinquency from the degree of recidivism to the seriousness of delinquency is involved in the results reported by Slawson for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence, Results of Tests of Non-Verbal Concrete Intelligence, and Results of Tests of Mechanical Intelligence. This change apparently tends to be accompanied by a slight decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.035$ ,<sup>61</sup> the second of these coefficients being lower than the first for six of the eight series of results, equal to the first for one series, and higher than the first for one series.<sup>69</sup>

(5) A difference in the standard test employed as the measure of mental inferiority in the case of verbal abstract intelligence is involved in certain results reported by Slawson<sup>60</sup> for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence. The particular test employed apparently may have an indifferent effect upon the degree of relationship, since the difference between the contrasted coefficients representing the Stanford-Binet and the National tests is  $-.01$ <sup>61</sup> for the first series of results and  $+.02$ <sup>61</sup> for the second series.

(6) A difference in the standard test employed as the measure of mental inferiority in the case of non-verbal concrete intelligence is involved in certain results reported by Slawson<sup>61</sup> for Juvenile De-

<sup>66</sup> It will be noted that a change in the type of relation is involved in one instance.

<sup>67</sup> Since certain of the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>68</sup> It will be noted that a change in the type of relation is involved in the case of the 8 coefficients considered, affecting the lowest coefficient only.

<sup>69</sup> It will be noted that a change in the type of relation is involved in two instances.

<sup>60</sup> The results in question are for Stanford-Binet test score and National A + B test score for a group at the New York House of Refuge.

<sup>61</sup> The results in question are for Dearborn Series II (old form) test score and Thorndike Non-Verbal test score for a group at the New York House of Refuge.

linquents, United States, in the case of Results of Tests of Non-Verbal Concrete Intelligence. The particular test employed apparently may have a slight effect upon the degree of relationship, since the mean difference between the contrasted coefficients representing the Dearborn and the Thorndike tests is  $-.055$ ,<sup>62</sup> the second of these coefficients being lower than the first for the two series of results.<sup>63</sup>

In appraising the correlational results in the light of the six factors considered, it should be noted that four of these factors fail to show a noteworthy effect, and that the remaining factors, although apparently of some importance in the case of the data affected, fail to suggest the influence of any constant errors upon the particular types of evidence involved. Accordingly, in an evaluation of the data as a whole it is probably safe to overlook their effect.

A consideration of the magnitude of the coefficients represented in the analysis in relation to their probable errors (if reported) gives the following information:

(1) Probable errors are reported for 27 of the 37 coefficients under consideration.

(2) Of these coefficients, 2 are at least four times their probable errors, 2 are at least three times their probable errors, 7 are at least twice their probable errors, and 16 are less than twice their probable errors, in magnitude.

(3) The 2 coefficients which are at least four times their probable errors are  $-.20$  and  $-.50$ , respectively.<sup>62</sup>

It will be noted that the two coefficients which are shown by the data under consideration to be sufficiently reliable to be taken as a dependable indication of real relationship point to a low or marked degree of negative correlation between delinquency and mental inferiority. This finding is of special interest because of the fact that the relationships which may be regarded as satisfactorily established represent two of the most objective types of evidence considered in the research, and because of the further fact that these two types of evidence tend to show the lowest degree

<sup>62</sup> Since the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between delinquency and mental inferiority.

<sup>63</sup> It will be noted that a change in the type of relation is involved in the second instance.

of relationship between delinquency and mental inferiority found in the research.<sup>64</sup>

A comparison between the zero order and the corresponding first order coefficients of correlation in the ten instances in which the latter are reported reveals additional facts of interest, as follows:<sup>65</sup>

(1) In the case of Reports of Amount of Schooling, for Adult Criminals, United States, a coefficient of  $+0.06$ , representing the correlation of number of previous convictions with grade finished in school, reported by Fernald, Hayes, and Dawley, becomes  $+0.03$  if chronological age is held constant, and  $-0.05$  if intelligence is held constant.

(2) In the case of Results of Tests of Verbal Abstract Intelligence, for Adult Criminals, United States, coefficients of  $+0.05$  and  $-0.09$ , representing the correlations of number of previous convictions and number of months served in penal institutions with test aggregate, reported by Fernald, Hayes, and Dawley, remain unchanged in both cases if chronological age is held constant; and for Juvenile Delinquents, United States, coefficients of  $-0.09$  and  $-0.13$ , representing the correlations of number of arrests and severity of delinquent career with National A+B test score, reported by Slawson, become  $+0.01$  and  $-0.06$ , respectively, if chronological age is held constant.

(3) In the case of Results of Tests of Non-Verbal Concrete Intelligence, for Juvenile Delinquents, United States, coefficients of  $-0.10$  and  $-0.20$ , representing the correlations of number of arrests and severity of delinquent career with Thorndike Non-Verbal test score, reported by Slawson, become  $-0.03$  and  $-0.15$ , respectively, if chronological age is held constant.

(4) In the case of Results of Tests of Mechanical Intelligence, for Juvenile Delinquents, United States, coefficients of  $-0.50$  and  $-0.10$ , representing the correlations of number of arrests and severity of delinquent career with Stenquist Mechanical test score, reported by Slawson, become  $+0.04$  and  $-0.04$ , respectively, if chronological age is held constant.

Although the facts presented in the foregoing comparison are too meager to permit the formulation of definite conclusions, particularly in view of the fact that only two of the zero order coeffi-

<sup>64</sup> In substantiation of this point consult the frequency distribution of the coefficients showing the degree of relationship found between delinquency and mental inferiority, as given in Appendix IV, Section 1, and the graphic interpretation of the correlational results of the research for studies of the relation between delinquency and mental inferiority, as given in the first major division of Table XXX.

cients under consideration and none of the six first order coefficients for which probable errors are reported are as much as four times their probable errors in magnitude, they suggest the indirect effect upon the degree of correlation of factors which the usual type of correlational analysis fails to take into account.

In summary, then, it may be said that product-moment coefficients of correlation between measures of delinquency and mental inferiority point to a direct relation between morality and intellect which, although decidedly variable, tends to be but negligible in delinquent groups in this country. At the same time, a critical examination of the coefficients with reference to various factors apparently indicates that the degree of relationship revealed by the several types of evidence does not require qualification as a result of their effect. A consideration of the magnitude of the coefficients in relation to their probable errors, however, points rather to a low or marked degree of inverse relationship between the qualities investigated. It should be further noted that a comparison between the zero order and the corresponding first order coefficients of correlation suggests the indirect effect upon the degree of relationship of factors not usually considered.

## CHAPTER VII

### A SYNTHESIS OF STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY

THE detailed information included in the preceding abridged and tabular reviews of non-correlational and correlational studies of the relation between delinquency and mental inferiority is doubtless of more value than any compilation of the data which a synthesis of these studies might present. Nevertheless, a summary of the findings of these studies will afford an opportunity for formulating general conclusions as to the relation between delinquency and mental inferiority, and hence as to the relation between morality and intellect, which the detailed findings cannot give. Accordingly, this chapter provides a synthesis of studies of the relation between delinquency and mental inferiority.

The necessary data for the present synthesis will be found in Table XXIX, which presents a compilation of the correlational results of investigations of the relation between morality and intellect.<sup>1</sup> This table preserves intact the combined results of studies of the relation between delinquency and mental inferiority summarizing the individual results tabulated in the present division of the research.<sup>2</sup> For the sake of convenience the data referred to are reproduced in the following tabulation:<sup>3</sup>

<sup>1</sup> Owing to the fact that the compilation of studies of the relation between delinquency and mental inferiority included in the compilation cited above is confined to the results for Part I A, since coefficients for feeble-minded and delinquent groups are presented in this division of the research while coefficients for non-delinquent groups are presented in the succeeding divisions, the accompanying compilation consists of a rearrangement of the results presented in the first major division of the table referred to.

<sup>2</sup> An explanation of the method of combining coefficients of correlation for all types of subjects will be found in Chapter XXXI.

<sup>3</sup> A frequency distribution of the coefficients included in this compilation of correlational results for Part I A will be found in Appendix IV, Section 1.

Type of Group and Country	Total Popu- lation <sup>a</sup>	No. and Type of Coeffi- cients	Correlational Results <i>Single Coefficient, Weighted Mean, or Weighted Quartile Points<sup>b</sup> (Median<sup>c</sup> or Q<sub>1</sub> and Q<sub>3</sub>)</i>	
REPORTS CONCERNING DELINQUENCY				
General Feeble-Minded Popu- lation				
No Specific Country . . . . .	[3,000]	1 $\omega$		.32
United States . . . . .	[1,000]	1 $\omega$		.88
Great Britain . . . . .	[1,000]	1 $\omega$		.65
Feeble-Minded Persons at Large in Community				
United States . . . . .	1,211	1 $\omega$		.52
Feeble-Minded Persons in Insti- tutions				
United States . . . . .	856	1 $\omega$		.89
Great Britain . . . . .	[1,000]	1 $\omega$		.39
Feeble-Minded Children in Pub- lic Schools				
United States . . . . .	[11,441]	1 $\omega$		.52
Belgium . . . . .	300	1 $\omega$		.85
ESTIMATES OF MENTAL DEFICIENCY				
Adult Criminals				
United States . . . . .	[22,695]	1 $\omega$		.75
Great Britain and Ireland . .	[88,557]	1 $\omega$		.78
Great Britain . . . . .	5,591	7 $\eta$		.39
	[11,644]	18 $r_t$	.17 . . .	.60
Germany . . . . .	[1,619]	1 $\omega$		.56
Juvenile Delinquents				
United States . . . . .	[7,235]	1 $\omega$		.61
Great Britain . . . . .	730	1 $\omega$		.68
Sweden . . . . .	106	1 $\omega$		.67
Central Europe . . . . .	[10,365]	1 $\omega$		.70
Sex Offenders				
United States . . . . .	[7,564]	1 $\omega$		.86
Great Britain . . . . .	[17,420]	1 $\omega$		.78
Germany . . . . .	566	1 $\omega$		.71
Alcoholics				
Great Britain . . . . .	[6,887]	1 $\omega$		.91
REPORTS OF EDUCATIONAL STATUS				
<i>Reports of Illiteracy</i>				
Adult Criminals				
United States and Canada . .	50,677	1 $\omega$	—	.06
United States . . . . .	[22,664]	1 $\omega$		.12
Philippine Islands . . . . .	[8,338]	1 $\omega$		.11
Great Britain . . . . .	[1,000]	1 $\omega$		.56
France . . . . .	[1,000]	1 $\omega$		.11

Type of Group and Country	Total Popu- lation <sup>a</sup>	No. and Type of Coeffi- cients	Correlational Results
			<i>Single Coefficient, Weighted Mean, or Weighted Quartile Points<sup>b</sup> (Median<sup>c</sup> or Q<sub>1</sub> and Q<sub>3</sub>)</i>
<i>Reports of Illiteracy (Concluded)</i>			
Juvenile Delinquents			
United States . . . . .	69,441	1 $\omega$	.22
Porto Rico . . . . .	56	1 $\omega$	.29
Great Britain . . . . .	1,206	1 $\omega$	.23
Germany . . . . .	[1,000]	1 $\omega$	— .01
Sex Offenders			
United States . . . . .	3,039	1 $\omega$	.06
Alcoholics			
Great Britain . . . . .	865	1 $\omega$	.48

*Reports of Amount of Schooling*

Adult Criminals				
United States .....	22,231	3 $\omega$		.12
	452	1 $r$		.06
Great Britain .....	513	1 $\eta$		-.15
	856	2 $r_t$		-.04
Juvenile Delinquents				
United States .....	24,341	2 $\omega$		.20
Germany .....	245	1 $\omega$		.23
Sex Offenders				
United States .....	810	1 $\omega$		.20

*Reports of School Progress*

Adult Criminals				
United States .....	365	1 $\omega$		.11
Juvenile Delinquents				
United States .....	[8,776]	4 $\omega$	.47	.52
Germany .....	229	1 $\omega$		.08
Sex Offenders				
United States .....	88	1 $\omega$		.07

*Reports of Educational Achievement*

Adult Criminals				
Great Britain .....	1,004	2 $r_t$		-.10
Juvenile Delinquents				
Great Britain .....	361	3 $\omega$		*.49

RESULTS OF INTELLIGENCE TESTS

*Results of Tests of Verbal Abstract Intelligence*

Adult Criminals				
United States .....	11,461	9 $\omega$	.53	.72
	2,249	6 $\eta$		.04
	747	2 $r$		-.02
Great Britain .....	830	2 $\omega$		-.42
Australia .....	117	1 $\omega$		.83

Type of Group and Country	Total Popu- lation <sup>a</sup>	No. and Type of Coeffi- cients	Correlational Results	
			Single Coefficient, Weighted Mean, or Weighted Quartile Points <sup>b</sup> (Median <sup>c</sup> or $Q_1$ and $Q_3$ )	
<i>Results of Tests of Verbal Abstract Intelligence (Concluded)</i>				
Juvenile Delinquents				
United States . . . . .	[38,685]	20 $\omega$	.46 . . .	.67
	544	2 $r_t$		.22
	13	1 $\rho$		.35
	[4,399]	22 $r$	-.07 . . .	+.06
Canada . . . . .	[420]	4 $\omega$	.38 . . .	.49
Great Britain . . . . .	758	6 $\omega$	.19 . . .	.42
Sex Offenders				
United States . . . . .	[2,400]	5 $\omega$	.75 . . .	.78 <sup>d</sup>
	902	4 $\eta$		.22
	451	2 $r$		.16

*Results of Army Mental Tests*

Adult Criminals				
United States . . . . .	[35,931]	2 $\omega$		.04
Juvenile Delinquents				
United States . . . . .	394	2 $\omega$		.11

*Results of Tests of Non-Verbal Concrete Intelligence*

Juvenile Delinquents				
United States . . . . .	3,009	3 $\omega$	*.17 <sup>e</sup>	
	61	2 $\rho$		.04
	2,528	6 $r$		-.01

*Results of Tests of Mechanical Intelligence*

Juvenile Delinquents				
United States . . . . .	454	5 $\omega$		.01
	1,528	4 $r$		-.11

<sup>a</sup> The number tabulated is the gross number of cases represented by all the coefficients opposite the number in question, regardless of any duplication that may have occurred in the subjects for these coefficients.

The numbers in brackets were supplied in whole or in part in accordance with a routine procedure, which required that a reasonable population be inferred from the nature of the data or the subjects for the group in question in those instances in which the number of cases for a particular group was not given in the original source.

<sup>b</sup> The method of weighting used was quantitative. The weight applied to each coefficient corresponded to the number of cases represented by the coefficient in question, this number being taken as the frequency of that coefficient in the calculation of the weighted mean (or of the weighted quartile points in those instances in which the heterogeneity of the groups to be combined failed to justify the calculation of a weighted mean).

<sup>c</sup> A weighted median is distinguished from a weighted mean by an asterisk.

<sup>d</sup> It is noteworthy that 4 of the 5 coefficients combined in this instance fell within the limits of a single step interval, ranging from .75 to .79.

<sup>e</sup> It should be noted that, although the 3 coefficients combined in this instance were .18 (represented by 1,514 cases), .18 (represented by 1,420 cases), and the decidedly divergent figure of .79 (represented by 75 cases), the weighted median reported is lower than any one of the 3 coefficients involved, due to the fact that the limits of the step interval in which the median fell extended from .1450 to .1950.



A compilation of the correlational results of studies of the relation between delinquency and mental inferiority as given in the foregoing tabulation may be interpreted briefly as follows:

(1) The correlation between delinquency and mental inferiority as found in the case of feeble-minded groups is clearly positive, and tends to be marked in degree.

(2) The correlation between delinquency and mental inferiority as found in the case of delinquent groups is usually positive, and tends to be low in degree.

In conclusion, therefore, it may be stated that the evidence as to the relation between delinquency and mental inferiority presented in Part I A of the research varies greatly, but indicates that a direct and marked relation exists between morality and intellect among feeble-minded groups, and that a direct and low relation exists among delinquent groups, in this country and abroad.

In comment upon this conclusion, however, it should be pointed out that various extraneous and selective factors have entered in to affect the degree of relationship found.<sup>4</sup> Notable among these factors are the type of subject and the type of comparative data utilized, the tendency of the more intelligent offender to escape detection as delinquent, a difference in the ages of the paired groups, the marked or partial subjectivity of the data, a geographical disparity in the data for the paired groups, an unrepresentative intelligence distribution for one or both of the paired groups, the lock-step system of promotion, and a difference in the racial composition of the paired groups. Since the total effect of the factors considered has probably been to raise the results obtained in the case of both types of subjects, the true relation between morality and intellect in accurately measured, restricted groups of the types investigated is presumably lower in the case of feeble-minded groups, and likewise lower in the case of delinquent groups, than these results indicate. At the same time, it is quite uncertain that the relation is low in the former instance, and hardly prob-

<sup>4</sup> Attention has already been called to the influence of such factors in the detailed interpretations of the individual tables in the preceding chapter. The matter is further discussed in a consideration of various factors which affect the correlational results of the research, including an analysis of the effect of different types of subjects, an analysis of the effect of different types of evidence, types of groups, countries, and types of coefficients, and an analysis of the effect of chance inaccuracies in the original measures, to which Chapter XXXII will be devoted.

able that it is negligible in the latter instance. Hence the conclusion is apparently justified that there is a direct and marked relation between morality and intellect among feeble-minded groups, and a direct and low relation between morality and intellect among delinquent groups, in this country and abroad.<sup>5</sup>

<sup>5</sup> Although the significance of the various types of coefficients tabulated in the research has been carefully indicated in the detailed tables presenting the individual coefficients, in the syntheses of studies of the relation between delinquency and mental inferiority and likewise generally throughout the appropriate sections of the research, regardless of the types of coefficients concerned, for the sake of convenience the degree of relationship revealed by a given type of coefficient is interpreted as *in feeble-minded groups* or *in delinquent groups*, according to the experimental group represented by the result in question. For technical interpretive purposes, however, it should be borne in mind that the degree of relationship found in the case of coefficients of colligation calculated from data for paired feeble-minded and non-feeble-minded groups, or coefficients of colligation calculated from data for paired delinquent and non-delinquent groups and tetrachoric coefficients of correlation calculated from data for criminals and the non-criminal community, involves control groups which are non-feeble-minded in the first case and non-delinquent in the last two cases; and that accordingly a more precise phrasing would take both the experimental and the control groups into account. The particular coefficients affected by this distinction in interpretation are the coefficients of colligation presented in Tables I and II, and the tetrachoric coefficients of correlation presented in Table IV, A, in Chapter VI.

PART I B

STUDIES OF THE RELATION BETWEEN MORAL  
CHARACTER AND INTELLIGENCE



## CHAPTER VIII

### A BRIEF SURVEY OF STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE<sup>1</sup>

THE principal considerations in the general organization of subject matter in Part IB were the need for orientation in the division of the research concerned with the relation between moral character and intelligence, the necessity for a compact presentation of the many studies bearing upon this problem, and the desirability of relating the subject matter presented in this division of the research with that presented in the preceding division. Accordingly, the present chapter supplies a brief survey of studies of the relation between moral character and intelligence, whereas the succeeding chapters offer a tabular review of correlational studies of the relation between moral character and intelligence, and a synthesis of studies of this relation.

The brief survey offered in the two sections of this chapter includes a description of the studies reviewed in the investigation of the relation between moral character and intelligence, and an analysis of the three primary methods of classification employed in the research as applied to studies in non-delinquent groups.

#### SECTION I

##### A DESCRIPTION OF THE STUDIES REVIEWED IN THE INVESTIGATION OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE<sup>2</sup>

From the theoretical standpoint the most important aspect of a study of the relation between morality and intellect is hardly to be

<sup>1</sup>In this research *moral character* will be used to refer to both personal and social morality; but will not be taken to include ethical discrimination or judgment, nor the affective and volitional aspects of character. *Intelligence* will be used to include abstract, social, and mechanical intelligence.

<sup>2</sup>The studies reviewed in the investigation of the relation between moral

found in a consideration of the relation between delinquency and mental inferiority, but rather in a consideration of the relation between moral character and intelligence, because of the less restricted nature of the groups which may be investigated.

Studies of the relation between moral character and intelligence are fairly numerous, although notably fewer than studies of the relation between delinquency and mental inferiority. For information as to these studies, however, it is necessary to consult reviews and bibliographies in the general field of personality and character, since compilations of investigations specifically related to the problem of this chapter are apparently rare and for the most part incidental in nature, while compilations of the titles of these investigations appear to be practically non-existent. At the present time a number of important reviews and bibliographies which list numerous titles in this general field are available. These include the recent reviews and bibliographies of personality and character tests by May and Hartshorne (163), by May, Hartshorne, and Welty (164), by the Committee on Character Education of the National Education Association (167), and by Watson (207), each of which lists no fewer than 150 titles, the first two being part of a series prepared in connection with the Character Education Inquiry, a review appearing annually for five years; *A Bibliography of the Analysis and Measurement of Human Personality up to 1926* prepared under the auspices of the National Research Council (168), which lists 1,364 titles; and *A Bibliography of Character and Personality* by Roback (178), published in 1927, which lists 3,341 references for studies in both delinquent and non-delinquent groups, and is the most comprehensive in its field.<sup>3</sup>

An examination of these sources reveals a rapidly growing literature having reference to the relation between moral character

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character and intelligence include studies published prior to January 1, 1928, and, in addition, the study of the relation between character and intellect published in Appendix I, Section 2, of this volume.

The findings of the Character Education Inquiry as independent evidence of the relation between morality and intellect will be reviewed in the concluding chapter of this volume, since the five-year investigation represented in these findings undoubtedly contributed the most important results bearing upon the relation between moral character and intelligence which have appeared following the date indicated.

<sup>3</sup> Other reviews and bibliographies which may be consulted with profit include those by Allport (124), Cady (130), Folsom (141), H. L. Hollingworth (147), May and Hartshorne (162), Roback (179), Symonds (188), Watson (206), (208), Webb (209), and Young (213).

and intelligence, which includes a considerable number of important investigations, extending in some cases over a period of years, utilizing improved tools and techniques, and reaping a rich harvest of important results.

In the selection of studies of the relation between moral character and intelligence for review in this investigation, one main principle was operative; namely, to include only correlational studies. Since, as indicated in Chapter II, the employment of correlational procedures is strikingly characteristic of studies in non-delinquent groups,<sup>4</sup> and since studies utilizing such procedures are readily comparable with one another, the desirability of adhering to this principle is apparent.<sup>5</sup>

In spite of this restriction to correlational studies in the type of studies reviewed, the references as to the relation between moral character and intelligence utilized in this investigation have been culled from a large number of sources. These include the reviews and bibliographies already cited, reports of experimental investigations involving measures of moral character and intelligence, general or theoretical discussions in the fields of character and personality and tests and measurements, and the necessary hand-

<sup>4</sup>An important exception to the correlational approach in the case of studies of the relation between moral character and intelligence is to be found in the comparative study of gifted children with respect to their performance on objective tests of character and their possession of desirable character traits, the standard of comparison being the standing of unselected or average children, or the rater's idea of average. A number of investigations of this type are summarized by L. S. Hollingworth (148, pp. 119-26).

<sup>5</sup>In keeping with the definition of moral character adopted in the research, as given earlier in this chapter, certain exclusions in measures of character or personality correlated with measures of intelligence were practiced. These included all measures of the emotional and volitional aspects of character, and of ethical discrimination or judgment. The first of these exclusions is justified by practical considerations, and by the desirability of coördinating Part I B of the research with the two parts of the research which are to follow; the second is justified by the fact that ethical discrimination or judgment appears to be more or less a composite of morality and intellect, and in fact probably mainly intellectual.

These exclusions may be concretely illustrated by selections from the classifications of traits used in the investigation of gifted children by Terman and his associates (cf. 189, pp. 519-29, 538-42), and by selections from the classifications of personality and character tests employed in the reviews of such tests by May and Hartshorne (162), (163), and by May, Hartshorne, and Welty (164). An account of these classifications and their use in this investigation will be found in Appendix I, Section 3, in which the principles of selection followed in excluding certain measures of character and personality and in classifying ratings as to intelligence are outlined.

books of census data, educational statistics, and statistical method. As a result, the reviews of studies of the relation between moral character and intelligence presented in this investigation presumably provide an adequate historical survey of the subject.<sup>6</sup>

## SECTION 2

### AN ANALYSIS OF THE THREE PRIMARY METHODS OF CLASSIFICATION EMPLOYED IN THE RESEARCH AS APPLIED TO STUDIES IN NON-DELINQUENT GROUPS

An analysis of the three primary methods of classification employed in the research as applied to studies in non-delinquent groups, that is, studies of the relation between moral character and intelligence, is given below.<sup>7</sup>

The first primary method of classification is the classification according to types of evidence. The major and minor types of evidence as to the relation between morality and intellect contributed by studies of the relation between moral character and intelligence are as follows:

RATINGS AS TO INTELLIGENCE: Ratings as to Abstract Intelligence, Ratings as to Social Intelligence.

REPORTS OF EDUCATIONAL STATUS: Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement.

REPORTS OF EXTRA-CURRICULAR ACTIVITIES.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Tests of Mechanical Intelligence.

The second primary method of classification is the classification

<sup>6</sup> References utilized in studies of the relation between moral character and intelligence are listed in Appendix V, Section 2. In addition to their restricted use in this presentation, the references given constitute a working bibliography in this field.

<sup>7</sup> It should be stated that, although this analysis is based only on the studies of the relation between moral character and intelligence which are presented in this division of the research, the comparison of the three parts of the research as to types of evidence, types of groups, and countries which will be offered in Chapter XXX discloses that no new items would be added to the analysis by the inclusion of the investigations reported in the two divisions of the research which follow, with the exception of one type of evidence which represents a combination of two of those named above, that is, Ratings as to Abstract and Social Intelligence.



according to types of groups. The following types of groups are represented in the tabular reviews of these studies:

NON-DELINQUENT GROUPS: General Population, Royalty, Aviation Cadets, College Graduates, College Students, School Children, Boy Scouts.

The third primary method of classification is the classification according to countries. The following countries are represented in the tabular reviews of these studies:

NON-DELINQUENT GROUPS: United States, Europe, Great Britain.

## CHAPTER IX

### A TABULAR REVIEW OF CORRELATIONAL STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE

THE present tabular review of correlational studies of the relation between moral character and intelligence is analogous to the foregoing tabular review of correlational studies of the relation between delinquency and mental inferiority. Because of the large number of investigations represented and the great importance of some of the studies included, this review affords very significant evidence as to the relation between moral character and intelligence,<sup>1</sup> and hence as to the relation between morality and intellect.

As previously indicated, studies of the relation between moral character and intelligence are almost exclusively correlational. Moreover, so many investigators have made use of correlational procedures in studies in non-delinquent groups that correlational studies of the relation between moral character and intelligence greatly exceed in number correlational studies of the relation between delinquency and mental inferiority. Even so, the correlational procedures employed in studies in non-delinquent groups appear to be less varied in character than those employed in studies in delinquent groups. Notwithstanding, at least three types of coefficients have been reported in the literature. Accordingly, the review of correlational studies in non-delinquent groups included in this chapter is concerned with the following series of coefficients calculated between measures of moral character and intelligence: (1) tetrachoric coefficients of correlation; (2) rank-difference

<sup>1</sup>The tabular reviews of the investigation of the relation between moral and intellectual traits presented in Part II, and of the investigation of the relation between conduct and intelligence presented in Part III, are closely related to the present tabular review of Part I B, in that they also afford evidence as to the relation between moral character and intelligence. For this reason the correlational results for Part I B, Part II, and Part III will be combined in the synthesis of the several investigations of the relation between morality and intellect included in the research which is presented in the Conclusion.

coefficients of correlation; and (3) product-moment coefficients of correlation.

The several types of coefficients enumerated above have been assigned to three tables, which together constitute the tabular review of correlational studies of the relation between moral character and intelligence.<sup>2</sup> These tables will be presented and interpreted in order in the succeeding sections.

## SECTION I

### TETRACHORIC COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF MORAL CHARACTER AND INTELLIGENCE

Table VII presents tetrachoric coefficients of correlation between measures of moral character and intelligence.

The table contains the routine information required in a tabular review of correlational studies in non-delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case simply the tetrachoric coefficient of correlation, with its probable error if reported.

The major and minor types of evidence as to the relation between moral character and intelligence contributed by the data tabulated are as follows:

**RATINGS AS TO INTELLIGENCE:** Ratings as to Abstract Intelligence.

<sup>2</sup> A frequency distribution of the coefficients showing the degree of relationship found between moral character and intelligence, including the most significant correlational results presented in Part IB, as tabulated in this review, is given in Appendix IV, Section 2. In this distribution the results for the several types of coefficients and the individual tables are analyzed by types of evidence, and may be identified by the numbers of the tables as given in the analysis.

In the tabulation of the different types of coefficients in the present review, on the assumption that coefficients obtained by non-standard methods would be so designated, in the absence of evidence to the contrary undesignated coefficients as well as coefficients designated as product-moment were assigned to the table of product-moment coefficients of correlation.

Evidence to the contrary consisted principally in type of data. Thus undesignated coefficients derived from data apparently involving alternative categories were assigned to the table of tetrachoric coefficients of correlation, whereas undesignated coefficients derived from ranked data were assigned to the table of rank-difference coefficients of correlation.

TABLE VII  
TETRACHORIC COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF MORAL CHARACTER AND INTELLIGENCE

AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF CORRELATION	
					MORAL CHARACTER	INTELLIGENCE	$r_t$	P.E.
					NON-DELINQUENT			
					RATINGS AS TO INTELLIGENCE			
					RATINGS AS TO ABSTRACT INTELLIGENCE			
			GENERAL POPULATION					
			<i>Great Britain</i>					
Goring (145, pp. 254, 262, 277) Pearson		1913	Sample of general population		Extreme forms of alcoholism	Mental defectiveness	.69 <sup>a</sup>	About .76 <sup>b</sup>
Wallin (205, p. 291) Heron		1924	General population		Inebriety	Mental defect		
			ROYALTY					
			<i>Europe</i>					
Woods (212, pp. 1, 10, 13, 15, 17-20, 32-34, 237-259, 275)	About 1500 c-	1900	Interrelated individuals in all modern royal families, England, Germany, France, Netherlands, Spain, Portugal, Austria, Italy, Russia, Denmark, and Sweden	608	Grade assigned on basis of adjectives used by biographers and historians as to moral qualities	Grade assigned on basis of adjectives used by biographers and historians as to mental qualities	.34	±.04
			SCHOOL CHILDREN					
			<i>Great Britain</i>					
Pearson (175, pp. 105-107, 126-127, 146)		1906	School children of both sexes	4,023 Boys 1,923 Girls	Classification by teachers as to conscientiousness	Classification by teachers as to ability	.46 .43	

<sup>a</sup> One or more partial coefficients of correlation of interest in this connection are referred to by Goring as follows: "... employing appropriate partial correlation methods, Pearson has been able to settle finally the previously vexed question of the relation between alcoholism and defective intelligence, by demonstrating that, of these two conditions, it is the latter which is antecedent, and the former which is consequent." (145, p. 266)

<sup>b</sup> This coefficient, which is based on "certain empirical data and certain mathematical assumptions," is reported as "about .76 (between .69 and .82)" (cf. 205, p. 291).

<sup>c</sup> "The period covered extends in general back to about the sixteenth century, but in the case of Spain and Portugal, to the eleventh century." (212, p. 13)

The following types of groups are represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: General Population, Royalty, School Children.

The following countries are likewise represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: Europe, Great Britain.

The tetrachoric coefficients of correlation between measures of moral character and intelligence presented in Table VII afford wholly consistent evidence of a positive correlation between morality and intellect.

An inspection of the individual coefficients given in the table discloses that the five coefficients tabulated are all positive. Thus in every instance moral character was found to be directly associated with intelligence in the non-delinquent groups investigated.

An analysis of the coefficients for non-delinquent groups for the table as a whole, representing but one type of evidence,<sup>3</sup> may be interpreted briefly as follows:

The degree of correlation between moral character and intelligence disclosed by tetrachoric coefficients of correlation reported for non-delinquent groups varies from rather low to fairly high, centering about  $+ .46$ ; and was found low, marked, or high in the case of Ratings as to Abstract Intelligence.

A critical examination of the coefficients represented in this analysis with reference to any factors which may affect the degree of relationship found discloses the following facts:<sup>4</sup>

A difference in the sex represented by the subjects is involved in the results reported by Pearson for School Children, Great Britain, in the case of Ratings as to Abstract Intelligence. The particular sex represented apparently has an indifferent effect upon the degree of relationship, since the difference between the contrasted coefficients representing boys and girls is only  $-.03$  for the one

<sup>3</sup> A frequency distribution of the coefficients included in Table VII will be found in Appendix IV, Section 2.

The figure given in the interpretation which follows is the simple median of all the coefficients represented in this distribution.

<sup>4</sup> In calculating the difference between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease in the degree of relationship, the proper sign being prefixed.

series of results. It may be added that further significance is lent to this finding by the fact that only a slight effect upon the results for the two sexes is to be observed in data quite different in character reported by Clem and by Toops for School Children, United States, in Table IX.

In appraising the correlational results in process of interpretation in the light of the one factor considered, it should be noted that this factor fails to show a noteworthy effect. Accordingly, in an evaluation of the data as a whole it would appear that the results for the one type of evidence represented might be taken at their face value. Notwithstanding, the fact that all the coefficients tabulated are for one of the most subjective types of evidence, coupled with the finding of the apparent effect of the halo error upon this type of evidence in the case of both Table VIII and Table IX, suggests that the degree of relationship between moral character and intelligence revealed by the type of evidence in question is probably somewhat too high in the case of Ratings as to Abstract Intelligence. At the same time, it should be recognized that the small number of coefficients tabulated makes it necessary to regard the findings as tentative only.

A consideration of the magnitude of the coefficients represented in the analysis in relation to their probable errors (if reported) is limited to the following information:

(1) A probable error is reported for only 1 of the 5 relationships under consideration.

(2) The coefficient in question is more than eight times its probable error in magnitude.

(3) This coefficient, which is thus much more than four times its probable error, is .34.

It will be noted that the one coefficient which is shown by the data under consideration to be sufficiently reliable to be taken as a dependable indication of real relationship points to a low degree of positive correlation between moral character and intelligence. This finding would scarcely be anticipated in view of the fact that the relationship which may be regarded as satisfactorily established represents one of the least objective types of evidence considered in the research. It will be observed, however, that the ratings assigned in this instance had a comparatively objective basis.

In summary, then, it may be said that tetrachoric coefficients of correlation between measures of moral character and intelligence

point to a direct relation between morality and intellect which, although somewhat variable, tends to be marked in non-delinquent groups in European countries. At the same time, a critical examination of the coefficients with reference to the one factor applicable apparently indicates that the degree of relationship revealed by the one type of evidence does not require qualification as a result of its effect; whereas the apparent effect of the halo error upon the type of evidence concerned in other tables suggests that the degree of relationship revealed is probably too high in the case of Ratings as to Abstract Intelligence. Furthermore, a consideration of the magnitude of the most significant coefficient in relation to its probable error serves to emphasize the finding of a low degree of relationship between the qualities investigated. It should be recognized, however, that the small number of coefficients tabulated makes it necessary to regard the findings as tentative only.

## SECTION 2

### RANK-DIFFERENCE COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF MORAL CHARACTER AND INTELLIGENCE

Table VIII presents rank-difference coefficients of correlation between measures of moral character and intelligence.

The table contains the routine information required in a tabular review of correlational studies in non-delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case the uncorrected or the corrected rank-difference coefficients of correlation, with their probable errors if reported.

The major and minor types of evidence as to the relation between moral character and intelligence contributed by the data tabulated are as follows:

RATINGS AS TO INTELLIGENCE: Ratings as to Abstract Intelligence, Ratings as to Social Intelligence.

REPORTS OF EDUCATIONAL STATUS: Reports of Educational Achievement.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence.

TABLE VIII\*  
RANK-DIFFERENCE COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF MORAL CHARACTER AND INTELLIGENCE

NON-DELINQUENT										
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. of Cases	MEASURES		COEFFICIENT OF CORRELATION			
					MORAL CHARACTER	INTELLIGENCE	UNCORRECTED	CORRECTED		
							$\rho$ or $\rho(r)$	P.E.	$\rho(r) \infty \infty$	P.E.
Brandenburg (127, pp. 142-148, 151-152)		1925	COLLEGE STUDENTS <i>United States</i> Groups of senior engineering students, Purdue University Group I: members of vocational psychology class	29*	RATINGS AS TO INTELLIGENCE		Final rank, representing pooled judgments of 28 associates, as to	Final rank, representing pooled judgments of 28 associates, as to		
					RATINGS AS TO ABSTRACT INTELLIGENCE					
					Reliability	Accuracy				.66
					Cooperation	Accuracy				.72
					Sympathy	Accuracy				.64
					Sincerity	Accuracy				.33
					Industry	Accuracy				.60
					Moral habits	Accuracy				.36
					Reliability	Memory				.73
					Cooperation	Memory				.52
					Sympathy	Memory				.66
					Sincerity	Memory				.54
					Industry	Memory				.69
					Moral habits	Memory				.41
					Reliability	General ability				.72
					Cooperation	General ability				.83
					Sympathy	General ability				.64
					Sincerity	General ability				.50
					Industry	General ability				.29
					Moral habits	General ability				-.24
Reliability	Reasoning ability	.70								





TABLE VIII (Concluded)

NON-DELINQUENT										
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF CORRELATION			
					MORAL CHARACTER	INTELLIGENCE	UNCORRECTED	CORRECTED		
								$\rho$ or $\rho(r)$	P.E.	$\rho(r)$
Brandenburg (Cont.)			Group II	25	Sincerity	Popularity	.43			
					Industry	Popularity	.26			
					Moral habits	Popularity	.02			
					Reliability	Tact	.64			
					Cooperation	Tact	.80			
					Sympathy	Tact	.67			
					Sincerity	Tact	.36			
					Industry	Tact	.25			
					Moral habits	Tact	.13			
					Final rank, representing pooled judgments of 24 associates, as to	Final rank, representing pooled judgments of 24 associates, as to executive ability				
Reliability		.85								
Moral character		.51								
REPORTS OF EDUCATIONAL STATUS										
REPORTS OF EDUCATIONAL ACHIEVEMENT										
Brandenburg (127, pp. 144-145, 153-154)		1925	COLLEGE STUDENTS							
			<i>United States</i>							
			Group of senior engineering students who were members of vocational psychology class, Purdue University	29*	Final rank, representing pooled judgments of 28 associates, as to	School grades				.56

Webb (209, pp. 6-7, 78-80)	1909-1910	1915	<i>Great Britain</i> Men students in training college for elementary teachers	104	Separate listings in order of merit by 4 college lecturers with regard to general excellence of character	Separate listings in order of merit according to results of 3 college examinations (at ends of first, third, and fifth terms, respectively), including all subjects of curriculum, as to examination ability	.50 .41 .33 .19 .13	.60	± .05
RESULTS OF INTELLIGENCE TESTS									
RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE									
SCHOOL CHILDREN									
<i>United States</i>									
Woodrow (210, pp. 526, 528-530)	1926	1926	Classes of Grade III in certain public school, Minneapolis 3 B 3 A <sub>2</sub> 3 A <sub>1</sub>	29 30 28	Character ratings by teacher in 10 traits: reliability (including honesty), obedience, industry, social attitudes, self-control, judgment, punctuality, initiative, deportment, and thrift <sup>c</sup>	Mental age as determined by Otis Group Primary Scale	.48 ±.10 ±.12 ±.13 .10		

<sup>a</sup> With but two exceptions the men were in school together for 4 years (cf. 127, p. 145, fn.).

<sup>b</sup> The teachers had 2 months in which to observe the boys after receiving the mark sheets (cf. 128, p. 130).

<sup>c</sup> "Unfortunately, no marks at all are given . . . until the third grade. . . . Only in the two 3 A grades did marks exist for more than one semester." (210, pp. 528-529)

The following types of groups are represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: College Students, School Children.

The following countries are likewise represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: United States, Great Britain.

The rank-difference coefficients of correlation between measures of moral character and intelligence presented in Table VIII afford practically consistent evidence of a positive correlation between morality and intellect.

An inspection of the individual coefficients given in the table discloses that all but two of the sixty-six uncorrected coefficients and the one corrected coefficient tabulated, and thus sixty-five of the sixty-seven results given,<sup>5</sup> are positive. Moreover, although instances in which moral character was found to be inversely associated with intelligence in the non-delinquent groups investigated are to be noted in the study reported by Brandenburg for College Students, United States, in the case of Ratings as to Abstract Intelligence, this investigator is also represented in the table by data in which moral character was found to be directly associated with intelligence.

An analysis of the coefficients for non-delinquent groups, based upon a frequency distribution of the coefficients for the table as a whole classified according to types of evidence,<sup>6</sup> may be interpreted briefly as follows:

The degree of correlation between moral character and intelligence disclosed by rank-difference coefficients of correlation reported for non-delinquent groups varies from fairly low and negative to very high and positive, centering about  $+.54$ ; and was found low and negative on the one hand, or low, marked, or high and positive on the other hand, in the case of Ratings as to Abstract Intelligence; negligible, low, marked, or high in the case of Ratings as to Social Intelligence; and low or marked in the case of Reports

<sup>5</sup> Consisting of all the uncorrected coefficients and the one corrected coefficient, for which no uncorrected coefficient was reported in the original source.

<sup>6</sup> A frequency distribution of the coefficients included in Table VIII (consisting of all the uncorrected coefficients and the one corrected coefficient) will be found in Appendix IV, Section 2.

The figure given in the interpretation which follows is the simple median of all the coefficients represented in this distribution.

of Educational Achievement, and also in the case of Results of Tests of Verbal Abstract Intelligence.

A critical examination of the coefficients represented in this analysis with reference to various factors which may affect the degree of relationship found discloses the following facts:<sup>7</sup>

(1) A change in the measure of moral character from a specific moral trait to a general moral trait<sup>8</sup> is involved in the results reported by Brandenburg for College Students, United States, in the case of Ratings as to Abstract Intelligence, Ratings as to Social Intelligence, and Reports of Educational Achievement.<sup>9</sup> This change apparently tends to be accompanied by a decided decrease in the degree of relationship, since the median difference between the contrasted mean or single coefficients is  $-.34$ , the second of these coefficients being consistently lower than the first for the thirteen series of results.<sup>10</sup> Moreover, the fact that the individual values of the coefficients for specific traits are higher than the contrasted coefficient for a general trait in all but three of the forty-nine instances of contrast adds significance to the finding. It should be noted, however, that although this finding also tends to be confirmed by data somewhat similar in character reported by Webb for College Students, Great Britain, in Table IX, it is disputed by further data of this same general type reported by Webb and by Stead for School Children, Great Britain, in the table referred to.

(2) A change from a subjective measure of abstract intelligence with the same set of judges rating in moral character and intelligence to a relatively objective measure of abstract intelligence is involved in certain results reported by Brandenburg<sup>11</sup> for College Students, United States, in the case of Ratings as to Abstract Intelligence contrasted with Reports of Educational Achievement.<sup>9</sup>

<sup>7</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed. For more than one series of results the simple median of these differences is reported.

<sup>8</sup> In this discussion *moral habits* and *moral character* are both classed as general moral traits, since the accordant outcomes of the contrasts for the two traits appeared to justify this classification, although the former term is not so clearly general in its significance as the latter.

<sup>9</sup> For the purposes of this discussion the order of the coefficients reported by Brandenburg in the case of Reports of Educational Achievement has been changed from that given in the table to conform with the order of the corresponding coefficients for Ratings as to Abstract Intelligence and Ratings as to Social Intelligence.

<sup>10</sup> It will be noted that a change in the type of relation is involved in two instances.

<sup>11</sup> The results in question are for final rank, representing pooled judgments of 28 associates, a slight difference in wording in the name of one of the

This change apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the median difference between the contrasted mean and single coefficients is  $-.11$ , the second of these coefficients being lower than the first however for only three of the six series of results. At the same time, the well-known effect of the halo error, presumably operative in the case of the subjective measure described, might reasonably be expected to result in a higher degree of relationship for this type of data, although the magnitude of the error may be assumed to have been very much reduced by the use of a large number of judges. It should be added that an indifferent effect upon the degree of relationship for a more or less objective measure of abstract intelligence as compared with a subjective measure of abstract intelligence is to be noted in the case of data somewhat similar in character reported by Kohs and Irle and by Kornhauser for College Students, United States, by Webb for College Students, Great Britain, and by Flemming, by Fretwell, and by Kelley for School Children, United States, in Table IX, whereas a lower degree of relationship for a strictly objective measure of abstract intelligence as compared with a subjective measure of abstract intelligence is to be noted in less comparable data reported by Somers for College Students, United States, by Cady and by Flemming for School Children, United States, and by Webb for School Children, Great Britain, in the table referred to.

(3) A difference in the class representing a given school grade is involved in the results reported by Woodrow for School Children, United States, in the case of Results of Tests of Verbal Abstract Intelligence. The particular class investigated apparently has a decided effect upon the degree of relationship, since the total range of the three coefficients in the series, representing three third-grade classes in one school, is  $.38$ .

In appraising the correlational results in process of interpretation in the light of the three factors considered, it should be noted that two of these factors, although apparently of some importance in the case of the data affected, fail to suggest the influence of any constant errors upon the particular types of evidence involved; but that the second factor considered offers some confirmation of the importance of the halo error and shows the influence which it may exercise upon one of the more subjective types of evidence, while a similar influence may be inferred to be exerted upon the other highly subjective type of evidence because of such a finding for both types of evidence in the case of Table IX. Accordingly, in an evaluation of the data as a whole it is probably safe to over-

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traits used as a measure of moral character for the contrasted results being overlooked in this comparison.

look the effect of all but one of these factors, but it is necessary to keep in mind that as a result of this one factor the degree of relationship between moral character and intelligence revealed by the types of evidence in question is probably somewhat too high in the case of both Ratings as to Abstract Intelligence and Ratings as to Social Intelligence.

A consideration of the magnitude of the coefficients represented in the analysis in relation to their probable errors (if reported) gives the following information:

(1) Probable errors are reported for 4 of the 67 coefficients under consideration.

(2) Of these coefficients, 2 are at least four times their probable errors, 1 is at least twice its probable error, and 1 is less than twice its probable error, in magnitude.

(3) The 2 coefficients which are at least four times their probable errors are .60<sup>12</sup> and .48, respectively.

It will be noted that the two coefficients which are shown by the data under consideration to be sufficiently reliable to be taken as a dependable indication of real relationship point to a marked degree of positive correlation between moral character and intelligence. This finding gains in importance, moreover, because of the fact that the relationships which may be regarded as satisfactorily established represent two of the most objective types of evidence considered in the research.

In summary, then, it may be said that rank-difference coefficients of correlation between measures of moral character and intelligence point to a direct relation between morality and intellect which, although extremely variable, tends to be marked in non-delinquent groups in English-speaking countries. At the same time, a critical examination of the coefficients with reference to various factors apparently indicates on the one hand that the degree of relationship revealed by the more objective types of evidence does not require qualification as a result of their effect; and on the other hand, by reason of the apparent effect of the halo error implicit in one of the factors considered upon one of the least objective types of evidence in the present table and its inferred effect upon the other highly subjective type of evidence in this table from its apparent effect upon both types of evidence

<sup>12</sup> It chances that this coefficient is the one corrected coefficient included in the results under consideration.

in another table, that the degree of relationship revealed is probably too high both in the case of Ratings as to Abstract Intelligence and Ratings as to Social Intelligence. A consideration of the magnitude of the coefficients in relation to their probable errors, however, serves to emphasize the finding of a marked degree of relationship between the qualities investigated.

### SECTION 3

#### PRODUCT-MOMENT COEFFICIENTS OF CORRELATION BETWEEN MEASURES OF MORAL CHARACTER AND INTELLIGENCE

Table IX presents product-moment coefficients of correlation between measures of moral character and intelligence.

The table contains the routine information required in a tabular review of correlational studies in non-delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case the zero order uncorrected and corrected product-moment coefficients of correlation, with their probable errors if reported, and certain corresponding first order coefficients of correlation.

The major and minor types of evidence as to the relation between moral character and intelligence contributed by the data tabulated are as follows:

RATINGS AS TO INTELLIGENCE: Ratings as to Abstract Intelligence, Ratings as to Social Intelligence.

REPORTS OF EDUCATIONAL STATUS: Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement.

REPORTS OF EXTRA-CURRICULAR ACTIVITIES.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Tests of Mechanical Intelligence.

The following types of groups are represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: Aviation Cadets, College Graduates, College Students, School Children, Boy Scouts.



The following countries are likewise represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: United States, Great Britain.

The product-moment coefficients of correlation between measures of moral character and intelligence presented in Table IX afford practically consistent evidence of a positive correlation between morality and intellect.

An inspection of the individual coefficients given in the table discloses that all but seventeen of the two hundred ninety-one zero order uncorrected coefficients and all but ten of the eighty-eight zero order corrected coefficients tabulated, including two hundred seventy-nine of the two hundred ninety-eight most significant results given,<sup>13</sup> are positive.<sup>14</sup> Moreover, although instances in which moral character was found to be inversely associated with intelligence in the non-delinquent groups investigated are to be noted in the studies reported by Webb for College Students, Great Britain, in the case of Ratings as to Social Intelligence, by Webb for College Students, Great Britain, and by Flemming for School Children, United States, in the case of Reports of Educational Achievement, by May for College Students, United States, by Webb for College Students, Great Britain, by Flemming and by Raubenheimer for School Children, United States, by Webb for School Children, Great Britain, and by Voelker for Boy Scouts, United States, in the case of Results of Tests of Verbal Abstract Intelligence, and by Toops for School Children, United States, in the case of Results of Tests of Mechanical Intelligence, these investigators without exception are also represented in the table by data in which moral character was found to be directly associated with intelligence.

<sup>13</sup> Comprising all the uncorrected coefficients and seven corrected coefficients for which no uncorrected coefficients were reported in the original source.

<sup>14</sup> In order to restrict consideration to the relation between moral character and intelligence, throughout this interpretation coefficients preceded by an asterisk in Table IX will be treated as negative if positive and as positive if negative.

TABLE IX\*  
PRODUCT-MOMENT COEFFICIENTS OF CORRELATION BETWEEN MEASURES  
OF MORAL CHARACTER AND INTELLIGENCE

NON-DELINQUENT											
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF CORRELATION*				
					MORAL CHARACTER	INTELLIGENCE	ZERO ORDER		FIRST ORDER		
							UNCORRECTED	CORRECTED	UNCORRECTED	CORRECTED	
r	P.E.	r <sub>∞∞</sub>	P.E.	r <sub>12,3</sub>							
RATINGS AS TO INTELLIGENCE											
RATINGS AS TO ABSTRACT INTELLIGENCE											
Thorndike (191, p. 25)		1920	AVIATION CADETS <i>United States</i> Aviation cadets	137	Rating by flight commander as to character <sup>b</sup>	Rating by flight commander as to intelligence	.64				
	L. M. Chassell (Appendix 1, Section 2)	1899-1914	COLLEGE GRADUATES <i>United States</i> Graduates of Teachers College, Columbia University, who received degree of Doctor of Philosophy with Education as major subject <sup>d</sup>	92	Patings made by 6 professors as to character	Ratings made by 5 professors and 1 other officer of instruction as to intelligence <sup>c</sup>	.43 <sup>f</sup>	.71	.71	± .09	
105				Ratings made by 6 professors as to character	Ratings made by 6 professors as to success achieved as scholar-investigator-author <sup>e</sup>	.37 <sup>f</sup>	.51	.51	± .08		
Folsom (141, pp. 399-400, 408-409, 411-414)		1917	COLLEGE STUDENTS <i>United States</i> Entire senior class at small men's college	76	Ratings by approximately 28 <sup>b</sup> members of class as to kindness	Ratings by approximately 28 <sup>b</sup> members of class as to Mental activity	.13	.15	.13	± .08	
						General intelligence	.17	.20	.17	± .07	

			116	Mean of ratings by 3 members of faculty as to personal qualities <sup>1</sup>	Mean of ratings by 3 members of faculty as to intelligence	.56	±.04
Kols and Irie (156, pp. 74, 77, 79-81, 87)	1920	Students who entered service of Army or Navy, Reed College		Average ratings by instructors who knew students fairly well as to Industry Cooperativeness Moral trustworthiness Industry Cooperativeness Moral trustworthiness	Average ratings by instructors who knew students fairly well as to Intelligence Intelligence Accuracy Accuracy	.64 .52 .45 .79 .61 .61	
Kornhauser (157, pp. 440-441, 443-444)	1927	Two groups of college students Graduating seniors	68	Average rating by instructors to whom some of students were not so well-known as to industry	Average ratings by instructors to whom some of students were not so well-known as to Intelligence Accuracy	.56 .71	
Miner (165, pp. 130, 132)	1916	Seniors in College of Applied Science, Carnegie Institute of Technology	30	Ratings by 4 judges as to reliability	Ratings by 4 judges as to General ability Common sense	.84 .78	
Moore (166, pp. 418-420)	1921	Most uniform cases among members of freshman class, Dartmouth College	140	Rating by at least 4 members of faculty as to reliability	Rating by at least 4 members of faculty as to intelligence	.75	
Somers (185, pp. 7, 11, 22, 24-25, 41, 50-51)	1919-1922	Practically entire freshman class entering training course in September of first year specified, State Normal School for Women, Farmville, Va.	212	Ratings made by from 3 to 7 teachers well-acquainted with students as to Industry Sympathy Sincerity Industry Sympathy Sincerity	Ratings made by from 3 to 7 teachers well-acquainted with students as to Intelligence Intelligence Scholarship Scholarship	.60 .57 .48 .68 .61 .50	
Webb (200, pp. 9-19, folded table following p. 26, pp. 27-28, folded table following p. 28)	1915	Two groups of men students at training colleges during last 6 months of their second year of training	104	Estimates made by 2 prefects <sup>a</sup> (fellow-students of subjects) as to Impulsive kindness Tendency to do kindnesses on principle Trustworthiness Conscientiousness Pure-mindedness General excellence of character <sup>a</sup>	Estimates made by 2 prefects <sup>a</sup> (fellow-students of subjects) as to Quickness of apprehension Quickness of apprehension Quickness of apprehension Quickness of apprehension Quickness of apprehension	.14 .32 .28 .17 .08 .10	±.06 ±.05 ±.05 ±.05 ±.05 ±.05

\* The footnotes to Table IX will be found on pages 178 and 179

TABLE IX\* (Continued)

NON-DELINQUENT												
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF CORRELATION <sup>a</sup>					
					MORAL CHARACTER	INTELLIGENCE	ZERO ORDER		CORRECTED			
							UNCORRECTED	P. E.	r	P. E.	r <sub>∞</sub>	P. E.
Webb (Cont.)			Impulsive kindness Tendency to do kindness on principle Trustworthiness Conscientiousness Pure-mindedness General excellence of character <sup>o</sup>		Profoundness of apprehension Profoundness of apprehension Profoundness of apprehension Profoundness of apprehension Profoundness of apprehension Soundness of common sense Soundness of common sense Soundness of common sense Soundness of common sense Soundness of common sense Originality of ideas Originality of ideas Originality of ideas Originality of ideas Originality of ideas	.13 .50 .48 .48 .35 .46 .25 .54 .39 .44 .38 .36 .29 .33 .33 .31 .11 .19	± .06 ± .04 ± .04 ± .04 ± .04 ± .06 ± .04 ± .04 ± .04 ± .04 ± .06 ± .05 ± .05 ± .05 ± .05	.19 .69 .66 .66 .47 .62 .37 .79 .57 .64 .54 .53 .30 .47 .46 .43 .15 .26				
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		Impulsive kindness Tendency to do kindness on principle Trustworthiness Conscientious										



TABLE IX \* (Continued)

NON-DELINQUENT						COEFFICIENT OF CORRELATION*				
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		ZERO ORDER			FIRST ORDER
					MORAL CHARACTER	INTELLIGENCE	UNCORRECTED	CORRECTED	P.E.	
										r
Webb (209, pp. 9, 11-12, 14-19, folded table preceding p. 27, pp. 27-28, folded table preceding p. 29)	1915	Great Britain Four groups of school boys in 4 different schools, London	140	Estimates made by 2 class-masters to whom subjects were well-known as to General excellence of character <sup>w</sup> Tendency to show kindness Trustworthiness Conscientiousness General excellence of character <sup>w</sup> Tendency to show kindness Trustworthiness Conscientiousness General excellence of character <sup>w</sup> Tendency to show kindness Trustworthiness Conscientiousness General excellence of character <sup>w</sup> Tendency to show kindness Trustworthiness Conscientiousness General excellence of character <sup>w</sup>	Estimates made by 2 class-masters to whom subjects were well-known as to Quickness of apprehension Quickness of apprehension Quickness of apprehension Quickness of apprehension Profoundness of apprehension Profoundness of apprehension Profoundness of apprehension Soundness of common sense Soundness of common sense Soundness of common sense Soundness of common sense Originality of ideas Originality of ideas Originality of ideas Estimates made by 2 class-masters to whom subjects were well-known as to	.59	±.04	.82		
						.17	±.06	.29		
						.29	±.05	.41		
						.33	±.05	.47		
						.67	±.03	.94		
						.33	±.05	.52		
						.48	±.04	.71		
						.50	±.04	.75		
						.67	±.03	.88		
						.47	±.04	.69		
						.60	±.04	.81		
						.64	±.03	.84		
						.45	±.05	.59		
						.08	±.06	.10		
						.23	±.06	.32		
						.22	±.06	.32		

	COLLEGE STUDENTS	RATINGS AS TO SOCIAL INTELLIGENCE				RATINGS AS TO SOCIAL INTELLIGENCE			
		United States				United States			
Barr (125, p. 46)	1921	College freshmen	57	Three independent ratings by Dean of College, Dean of Women, and writer and advanced student as to Leadership	Three independent ratings by Dean of College, Dean of Women, and writer and advanced student as to Leadership	53 .51 .54 .50	±.04 ±.04 ±.04 ±.05	.79 .77 .77 .69	
Kohs and Irls (156, pp. 74, 77, 79-81, 87)	1920	Students who entered service of Army or Navy, Reed College	116	Mean of ratings by 3 members of faculty as to personal qualities <sup>1</sup>	Mean of ratings by 3 members of faculty as to leadership	.53 .72 .40 .70			
Kornhauser (157, pp. 441, 442-444)	1927	Two groups of college students Graduating seniors	68	Average ratings by instructors who knew students fairly well as to Industry	Average rating by instructors who knew students fairly well as to leadership ability	.69 .76 .63 .39			
Miner (165, pp. 130, 132)	1916	General undergraduate group	97	Cooperativeness Moral trustworthiness Average rating by instructors to whom some of students were not so well-known as to industry	Average rating by instructors to whom some of students were not so well-known as to leadership ability	.55			
Rolson (180, pp. 514-516)	1917	Seniors in College of Applied Science, Carnegie Institute of Technology	30	Ratings by 4 judges as to reliability	Ratings by 4 judges as to leadership	.18			
Somers (185, pp. 7, 11, 22, 24-25, 41, 50-51)	1919-1922	Girls all living in same house	21	Mean of rankings by 21 judges, including self, in thoughtfulness of others	Mean of rankings by 21 judges, including self, in leadership	.451 .53 .43			
	1923	Practically entire freshman class entering training course in September of first year specified, State Normal School for Women, Farmville, Va.	212	Ratings made by from 3 to 7 teachers well-acquainted with students as to Industry Sympathy Sincerity	Ratings made by from 3 to 7 teachers well-acquainted with students as to tact				

\* The footnotes to Table IX will be found on pages 178 and 179.

TABLE IX\* (Continued)

NON-DELINQUENT										
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES					
						MORAL CHARACTER	INTELLIGENCE	COEFFICIENT OF CORRELATION <sup>a</sup>		
								UNCORRECTED	ZERO ORDER	FIRST ORDER
Webb (209, pp. 9-19, folded table following p. 26, pp. 27-28, folded table following p. 28)	1912-1913	1915	<i>Great Britain</i> Two groups of men students at training colleges during last 6 months of their second year of training	194	Estimates made by 2 prefects <sup>a</sup> (fellow-students of subjects) as to degree of 'laet' in getting on with people  Estimates made by 2 prefects <sup>a</sup> (fellow-students of subjects) as to degree of 'laet' in getting on with people  Estimates made by 2 prefects <sup>a</sup> (fellow-students of subjects) as to degree of 'laet' in getting on with people	.34 .48 .33 .27 .17 .22 — .04	± .06 ± .05 ± .06 ± .09 ± .07 ± .06 ± .06	.50 .67 .46 .36 .23 .30 — .05	r <sub>12.3</sub>	
Flemming (140, pp. 11-12, 28-31, 38-43, 54-56, 62-63, insert facing p. 68, p. 103)	1922-1923	1925	<i>SCHOOL CHILDREN</i> <i>United States</i> Junior and senior high school groups, Horace Mann High School for Girls, Teachers College, Columbia University Junior High School: Years 1-11 and 111 (Grades VII-VIII and IX) <sup>a</sup>	40	Estimates made by 4 teachers as to Industry Consistentness  Ratings by 4 teachers as to leadership	.47 .36	± .09 ± .10			



Hughes (149, pp. 421, 427-430)	1925	Senior High School: Year V (Grade XI) High school seniors, Pasadena, Cal. <i>Great Britain</i>	60	Ratings by 4 teachers as to Industry Conscientiousness	Ratings by 4 teachers as to leadership	±.09 ±.09
Stead (186, pp. 190, 202-203, 208)	1926	Group of boys between ages of 12 and 13 years, 127 of whom were actually in elementary school and 8 of whom had just been admitted to secondary school	450	Ratings by teachers as to Trustworthiness Cooperation	Ratings by teachers as to capacity for leadership	±.02 ±.01
			135	Ratings by teacher who had been well-acquainted with boys for at least year as to Conscientiousness Trustworthiness General excellence of character	Rating by teacher who had been well-acquainted with boys for at least year as to leadership	.26 <sup>y</sup> .14 .26
REPORTS OF EDUCATIONAL STATUS						
REPORTS OF AMOUNT OF SCHOOLING						
May (160, pp. 429-430, 432-434)	1923	COLLEGE STUDENTS <i>United States</i> Liberal arts freshmen	450	Application to work, or general industry, measured by average number of hours per week spent in study	Number of units offered for entrance	.25
Miner (165, pp. 130, 132)	1916	Seniors in College of Applied Science, Carnegie Institute of Technology SCHOOL CHILDREN <i>United States</i>	30	Ratings by 4 judges as to reliability	Scholarship evaluated by number of credit hours	.72
Carly (120, pp. 17-18, 106)	1921-1922	Boys in grades ranging from fifth to tenth in certain city SCHOOL CHILDREN <i>United States</i>		Estimated incorrigibility	Grade location <sup>2</sup>	*-.02
Rees (181, pp. 439-442, 444)	1922	All pupils who were graduated from high school in June of year specified for whom complete records of both elementary and high school work were available, White Plains, N. Y.	46 <sup>aa</sup>	Average of teachers' marks in department	Amount of progress made per unit of time, obtained by dividing total number of periods of credit received in high school by number of semesters spent in earning them	.33

\* The footnotes to Table IX will be found on pages 178 and 179.

TABLE IX\* (Continued)

NON-DELINQUENT												
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. of Cases	MEASURES		COEFFICIENT OF CORRELATION <sup>a</sup>					
					MORAL CHARACTER	INTELLIGENCE	ZERO ORDER		FIRST ORDER	$r_{12.3}$		
							UNCORRECTED	CORRECTED				
											$r$	P. E.
Rees (182, pp. 7-8, 10, 13-15, 19-23)	1917	1925	Pupils who had completed Grade VIII during year specified who had been in local school system at least from beginning of Grade III, New Rochelle, N. Y.	134	Average school mark received in grade school in department II-III Grades IV-VI Grades VII-VIII	Grade progress as measured by number of semesters accelerated or retarded	.25 .17 .23	$\pm .05$ $\pm .06$ $\pm .06$				
REPORTS OF EDUCATIONAL ACHIEVEMENT												
L. M. Chassell (Appendix I, Section 2)	1899-1914	1935	Graduates of Teachers College, Columbia University, who received degree of Doctor of Philosophy with Education as major subjects	105	Ratings made by 6 professors as to character	Ratings made by 7 professors and 3 other officers of institution as to quality of dissertations <sup>b</sup>	.15 <sup>cc</sup>		.24 <sup>dd</sup>			
			COLLEGE STUDENTS <i>United States</i>	62	Ratings made by 6 professors as to character	Records of standing in preliminary written examination	.33 <sup>f</sup>		.46			
Kohs and Irie (155, pp. 74-75, 77, 81, 86)		1920	Students who entered service of Army or Navy, Reed College	101 103 107	Mean of ratings by 3 members of faculty as to personal qualities <sup>i</sup>	School marks in Natural Science Social Science Language and Fine Arts		.40 .44 .33	$\pm .06$ $\pm .06$ $\pm .06$			

Kornhauser (157, pp. 441, 444-445)	1927	General undergraduate group of college students	50	Average ratings by instructors to whom some of students were not so well-known as to: Industry Cooperativeness Moral trustworthiness	Average scholastic grade for year <sup>60</sup>	.76 .64 .58	
May (160, pp. 429-430, 432-434)	1923	Liberal arts freshmen	450	Application to work, or general industry, measured by average number of hours per week spent in study	Number of honor points	.32	
			450	Application to work, or general industry, measured by average number of hours per week spent in study	High school average grade <sup>61</sup>	.11	
Somers (185, pp. 7, 13, 22, 28-30, 41-42, 44, 51-52)	1910-1922	Members of freshman class entering training course in September of first year, specified who completed 2-year course, State Normal School for Women, Farmville, Va. <i>Great Britain</i>	156	Two years' score from official register, for class-cuts and failure to meet requirement in classroom work, designated as 'discipline' record	Accomplishment in normal school as measured by: Average of first semester's marks Average of first year's marks Average of two years' marks	*-.74 ±.02 ±.02 ±.02 *- .75 *- .76	
Webb (209, pp. 9, 19, folded table following p. 28, pp. 27-28, folded table following p. 28)	1912-1913	Two groups of men students at training colleges during last 6 months of their second year of training	194	Estimates made by 2 prefects (follow-students of subjects) as to: Impulsive kindness Tendency to do kindnesses on impulse Trustworthiness Conscientiousness Pure-mindedness General excellence of character <sup>62</sup>	Results of 3 terminal examinations on full general curriculum, given at ends of first, third, and fifth terms	.19 .74 ±.05 ±.02 ±.02 1.04 .69 .90 ±.03 ±.03 ±.04 ±.01	.27 .98 ±.05 ±.02 ±.02 1.04 .69 .90 ±.03 ±.03 ±.04 -.01
			194	Estimates made by 2 members of college staff as to general excellence of character	Results of 3 terminal examinations on full general curriculum, given at ends of first, third, and fifth terms	-.01	±.05

\* The footnotes to Table IX will be found on pages 178 and 179.

TABLE IX\* (Continued)

NON-DELINQUENT

AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. OF CASES	MEASURES		COEFFICIENT OF CORRELATION <sup>a</sup>					
					MORAL CHARACTER	INTELLIGENCE	ZERO ORDER		FIRST ORDER	r <sub>12.3</sub>		
							UNCORRECTED	CORRECTED				
							r	P.E.				
							r <sub>∞</sub>	P.E.				
Clem (137, pp. 4-10, 13-16, 18-19)	1922	1924	SCHOOL CHILDREN <i>United States</i> Groups of high school pupils, New York City Three classes of first-year girls averaging slightly less than 14 years of age, Wadsworth High School Three classes of first-year boys averaging slightly more than 14 years of age, De Witt Clinton High School	80  103	Ratings by teachers <sup>22</sup> as to Industry Earnestness	Combined weighted criterion score on series of 10 Latin tests .56 ±.05 .52 ±.05						
					Ratings by teachers <sup>22</sup> as to Industry Earnestness	Combined weighted criterion score on series of 10 Latin tests .69 ±.04 .65 ±.04						
Flemming (140, pp. 11-12, 28-29, 31-32, 35, 38-43, 53-56, 62-65, insert facing p. 68, pp. 71, 138-142)	1922-1923	1925	Junior and senior high school groups, Horace Mann High School for Girls, Teachers College, Columbia University Junior High School: Years I-II and III (Grades VII-VIII and IX) <sup>p</sup>	40 40 40 40 30 30	Ratings by 4 teachers as to Industry	Measures of school achievement Mean school achievement mark .69 ±.07				{ .37 <sub>ab</sub> .63 <sub>a</sub> .15 <sub>r</sub> .62 <sub>ii</sub> .23 <sub>ii</sub>		
					Conscientiousness	Mean school achievement mark .57 ±.08						
					Industry	Score on Haggerty Silent Reading Test, Sigma 3 (Form A) .30 ±.10						
					Conscientiousness	Score on Haggerty Silent Reading Test, Sigma 3 (Form A) .25 ±.10						
					Industry	Score on Stanford Achievement Test .25 ±.12						
					Conscientiousness	Score on Stanford Achievement Test .36 ±.11						

Senior High School: Year V (Grade XI)	60	Rankings by 4 teachers as to Industry	Measures of school achievement Mean school achievement mark	± .06
		Conscientiousness	Mean school achievement mark	± .08
		Industry	Score on Haggerty Silent Reading Test, Sigma 3 (Form A)	± .08
		Conscientiousness	Score on Haggerty Silent Reading Test, Sigma 3 (Form A)	± .08
	539	Ranking by teacher in industry	Ranking according to achieve- ment in 5 standardized edu- cational tests	.43 <sup>†</sup>
Fretwell (142, pp. 4-7, 11-13)	1916	Pupils of 14 teachers selected at random out of total of 24 teaching VI B classes for boys in 5 public schools, <sup>a</sup> Borough of Manhattan, New York City	Average grade	.62
Kelley (152, pp. 14-16, 36, 92-93)	1913	First- and second-year high school pupils in certain school	Average number of credits earned per semester multi- plied by average school mark made in entire high school course	.31
Ross (181, pp. 439- 442, 444)	1922	All pupils who were graduated from high school in June of year specified for whom complete records of both ele- mentary and high school work were available, White Plains, N. Y.	Average of teachers' marks for entire 8 grades in Spelling Geography Reading	.25 .16 .02
Ross (182, pp. 7-8, 13-15, 19-23)	1917	Pupils who had completed Grade VIII during year spec- ified who had been in local school system at least from beginning Grade III, New Rochelle, N. Y.	Average standing of pupil in high school for year	.35 ± .05
	134	Average school mark received in grade school <sup>b,c</sup> in deport- ment	Average school mark received in grade school in	.07 ± .06
	134	Average school mark received in grade school in deport- ment in	Arithmetic, Grades VII-VIII	.17 ± .06
		Grades IV-VI	Arithmetic, Grades VII-VIII	.15 ± .06
		Grades VII-VIII	Arithmetic, Grades VII-VIII	.32 ± .03
		Grades II-III	English, Grades IV-VI	.41 ± .03
		Grades IV-VI	English, Grades IV-VI	.28 ± .03
		Grades VII-VIII	English, Grades VII-VIII	.17 ± .06
		Grades II-IV	English, Grades VII-VIII	.35 ± .03
		Grades IV-VI	English, Grades VII-VIII	.25 ± .03
		Grades VII-VIII		

\* The footnotes to Table IX will be found on pages 178 and 179.



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\* The footnotes to Table IX will be found on pages 178 and 179.

TABLE IX\* (Continued)

NON-DELINQUENT											
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. of Cases	MEASURES		COEFFICIENT OF CORRELATION <sup>a</sup>				FIRST ORDER
					MORAL CHARACTER	INTELLIGENCE	ZERO ORDER		CORRECTED		
							UNCORRECTED	P.E.	$r_{\infty \infty}$	P.E.	
$r$	P.E.	$r_{\infty \infty}$	P.E.								
Somers (185, pp. 7, 11-12, 22-25, 41, 47-49)	1919-1922	1923	Members of freshman class entering training course in September of first year specified who completed 2-year course, State Normal School for Women, Farmville, Va.	156	Ratings made by from 3 to 7 teachers, well-acquainted with students as to Industry Sympathy Sincerity	Test-composite <sup>am</sup>	.35 .35 .25	± .05 ± .05 ± .05			$r_{12,3}$
Webb (209, pp. 9-22, folded table following p. 26, pp. 27-28, folded table following p. 28, pp. 29-31, 35, 38)	1912-1913	1915	Two groups of men students at training college during last 6 months of their second year of training First group  <i>Great Britain</i>	98	Estimates made by 2 prefects (fellow-students of subjects) as to Impulsive kindness Tendency to do kindnesses on principle Trustworthiness Conscientiousness Pure-mindedness General excellence of character <sup>o</sup>	Marks in 2 experimental tests of intelligence	.14 -.01	± .06 ± .06	.19 -.01		
							-.04 -.19 -.24 -.05	± .05 ± .05 ± .04 ± .05	-.05 -.25 -.31 -.06		
								.61	± .03	.74	











Webb (209, pp. 9, 11-12, 14-19, folded table preceding p. 27, pp. 27-28, folded table preceding p. 29)	1915	Great Britain Four groups of school boys in 4 different schools, London	140	Estimates made by 2 class-masters to whom subjects were well-known as to General excellence of character <sup>w</sup> Tendency to show kindness Trustworthiness Conscientiousness 'First impression' estimates made by 2 judges <sup>x</sup> as to general excellence of character	Marks on 2 experimental tests of intelligence	.19 — .09 .04 .17 .24 ± .08 ± .08 ± .08 ± .08 ± .08	.28 — .13 .08 .27 .35
Voelker (204, pp. 57, 112-113, 115-116, 122)	1921	Boy Scouts United States Members of Boy Scout troops specially trained in trustworthiness, New York City and Elizabeth, N. J. Members of Boy Scout troops not specially trained in trustworthiness, New York City and Brooklyn, N. Y.	17 21	Per cent change (gain or loss) in trustworthiness between intervals of 2 test series Per cent change (gain or loss) in trustworthiness between intervals of 2 test series	Intelligence quotient Intelligence quotient	.14 — .06	
RESULTS OF TESTS OF MECHANICAL INTELLIGENCE							
SCHOOL CHILDREN							
United States							
Truops (196, pp. 15, 17, insert table facing p. 22, pp. 23-24)	1923	Children ranging in age from 12 to 15 years, inclusive, Public School G, New York City Boys 435 107 131 151 120 15 57 Boys 435 107 131 151 120 15		Average conduct in school	Scores on intelligence tests  Stenquist Assembly Test of Mechanical Ability  Stenquist Mechanical Aptitude Tests I and II, combined	.01 — .06 — .02 .16 .21 .23 .11 ± .07 ± .05 ± .06 ± .09 ± .07 ± .05 ± .06 ± .09	

\* The footnotes to Table IX will be found on pages 178 and 179.



<sup>j</sup> The coefficients of correlation between industry and intelligence and between moral trustworthiness and accuracy for the ratings of each of 4 instructors, and the mean of the 4 coefficients for each pair of traits, are also given, but the group rated in each case is unspecified (157, p. 444).  
<sup>k</sup> For statistical uses the accepted basis of reliability in the rating of any individual has been the condition that at least four judges shall have judged him, and that none of them shall have varied from another by more than one letter grade.

<sup>l</sup> About 140 records, or 25 per cent. of the class, meet this condition . . . " (166, pp. 418-419)  
<sup>m</sup> The probable errors for the coefficients of intercorrelation for the 8 personality traits in which ratings were made by the teachers, the personality composite, and the "personality composite-less-self" ranged from  $\pm 0.1$  to  $\pm 0.5$ , but were not specified for the individual coefficients (cf. 185, p. 50, note).

<sup>n</sup> The two groups numbered 98 and 96 students, respectively. The average age of the first group was given as 21 years, and the second group was stated to be similar. (Cf. 209, p. 9.)  
<sup>o</sup> The 10 prefects "were arranged in pairs . . . and to each pair a group of 20 (or 19) students was assigned." At the beginning of the year the judges were instructed to study their subjects with a view to writing a general character sketch of each during the Easter holiday. The sketches were all written at the time appointed. The schedules of qualities in which ratings were to be assigned were then issued by the prefects some weeks after handing in the main schedules of qualities (cf. 209, pp. 10-11).

<sup>p</sup> "The intercorrelations were obtained for the prefects some weeks after handing in the main schedules of qualities (cf. 209, p. 15).  
<sup>q</sup> "The intercorrelations were obtained for each of Years I, II, and III (grades 7, 8, and 9), and the average of the three correlations in each comparison of any two traits was computed to represent the junior high school." (140, p. 29)

<sup>r</sup> The variable held constant is Terman Group Mental Test, Form B.  
<sup>s</sup> The variable held constant is teachers' estimate of school attitude.

<sup>t</sup> Namely, Public Schools 5, 108, 43, 184, and 186, Manhattan (cf. 142, p. 5).

<sup>u</sup> This figure is the mean of the coefficients for the 14 teachers; the individual coefficients, their probable errors, and their range are also reported in the original source (142, p. 13).

<sup>v</sup> Because of the subsequent utilization of the estimates for educational prognosis in mathematics, English, and history, none of the estimates used was made by the mathematics instructors of the pupils, and only a limited number by English and history teachers (cf. 152, pp. 4, 14).

<sup>w</sup> The four groups numbered 33, 35, and 37, respectively. The average age of the total group was 12 years. Two of the schools "were elementary schools under the control of the London County Council, one was an elementary school under the Hornsey Education Committee, and the fourth was a large secondary school with its own governing body." (Cf. 209, p. 9.)  
<sup>x</sup> This estimate "had been supplied previous to the issue . . . of the schedules in detail" (cf. 209, p. 17).

<sup>y</sup> These judges were as follows: at School I, 2 third year students from a neighboring training college; at School II, the writer and another member of the college staff; at School III, the writer and a lady who did the work at the request of the Head Master; at School IV, the writer and a member of the college staff other than the judge in the case of School II (cf. 209, p. 17).  
<sup>z</sup> The probable errors for the total number of coefficients of intercorrelation for character traits reported by the writer varied between  $\pm 0.2$  and  $\pm 0.6$  (cf. 186, p. 208).

<sup>aa</sup> . . . the city in which the work was done had a three track system, with constant shifting of pupils from one to the other grade division so that it was practically impossible to determine the normal grade location of many pupils." (129, p. 106)

<sup>ab</sup> Of this number 24 were girls and 22 were boys. (181, p. 440)

<sup>ac</sup> The 10 members of the instructional staff who assigned ratings as to quality of the dissertation included only 2 judges rating in character. The ratings provided such fragmentary data that supplementary ratings for use in a part of the statistical work were obtained in the case of a number of dissertations from one of the original judges and from an eleventh series of ratings assigned by a member of the staff of the Appointment Committee. (Cf. Appendix I, Section 2.)

<sup>ad</sup> The coefficient reported is the mean of the 4 alternate uncorrected coefficients calculated from the scores obtained by two methods for the treatment of fragmentary data.

<sup>ae</sup> The coefficient reported is the mean of the 2 corrected coefficients corresponding to the 4 alternate uncorrected coefficients described in the preceding footnote.  
<sup>af</sup> The coefficients of correlation between grades in a course and ratings in the course for each of from 2 to 4 instructors, and the mean of the coefficients for each pair of measures, are also given for the traits industry, cooperativeness, and moral trustworthiness (157, p. 445).

<sup>ag</sup> The quality of the high school preparation was measured in terms of the average grade obtained in the work offered for entrance. If the student offered in addition his Regents Examination marks in the State of New York, or if he offered College Entrance Board Examination marks, these were used in every case as being more reliable than the high school averages." (160, p. 432)

<sup>ah</sup> The Latin pupils in the two schools were placed in classes according to the results of a group test of intelligence. In each group the 3 classes selected represented the lower, the middle, and the upper ranges of ability, respectively. In the first group the 3 classes were taught by 3 teachers, in the second group, by a single teacher. (Cf. 137, pp. 4-6.)

<sup>ai</sup> The variable held constant is teachers' estimate of intelligence.

<sup>aj</sup> The variable held constant is teachers' estimate of physical energy.

<sup>ak</sup> The variable held constant is teachers' estimate of desire to excel.

<sup>al</sup> "Since the record in the first grade was lacking on so many cards it was omitted from consideration . . ." (182, pp. 14-15)

<sup>am</sup> Or in a few cases by appointment (cf. 141, p. 401).

<sup>an</sup> Derived from the scores of the Thurstone Cycle Omnibus Test (Psychological Test IV), the Somers Range of Information Test, and the Trabue Language Completion Tests Alpha and Beta (Kilgore revision), by a process of weighting (cf. 185, pp. 11-12, 23). Separate coefficients for the individual tests are also given in the original source (185, p. 48).

<sup>ao</sup> "Five hundred and eighty of these were in Grades VII, VIII, and IX of a junior high school; the remaining four hundred and fifty were ninth graders in a senior high school." (150, pp. 403-404) Separate coefficients for the two groups are given in the original source (150, p. 494).

An analysis of the coefficients for non-delinquent groups, based upon a frequency distribution of the most significant zero order coefficients for the table as a whole classified according to types of evidence,<sup>15</sup> may be interpreted briefly as follows:

The degree of correlation between moral character and intelligence disclosed by product-moment coefficients of correlation reported for non-delinquent groups varies from rather low and negative to extremely high and positive, centering about  $+0.325$ ; and was found negligible, low, marked, or high in the case of Ratings as to Abstract Intelligence; negligible but negative on the one hand, or low, marked, or high and positive on the other hand, in the case of Ratings as to Social Intelligence; negligible, low, or high in the case of Reports of Amount of Schooling; low in the case of Reports of School Progress; low or negligible but negative on the one hand, or negligible, low, marked, or high and positive on the other hand, in the case of Reports of Educational Achievement; low or marked in the case of Reports of Extra-Curricular Activities; low or negligible but negative on the one hand, or negligible, low, marked, or high and positive on the other hand, in the case of Results of Tests of Verbal Abstract Intelligence; and low or negligible but negative on the one hand, or negligible or low and positive on the other hand, in the case of Results of Tests of Mechanical Intelligence.

A critical examination of the coefficients represented in this analysis with reference to various factors which may affect the degree of relationship found discloses the following facts:<sup>16</sup>

(1) A change from a subjective measure of abstract intelligence with a different set of judges rating in moral character and intelligence to a relatively objective measure of abstract intelligence is involved in certain results reported by L. M. Chassell<sup>17</sup> for College

<sup>15</sup> A frequency distribution of the most significant zero order coefficients included in Table IX (comprising all the uncorrected coefficients and seven corrected coefficients) will be found in Appendix IV, Section 2.

The figure given in the interpretation which follows is the simple median of all the coefficients represented in this distribution, the signs of all coefficients preceded by an asterisk in the table having been changed to signify the relation between moral character and intelligence.

<sup>16</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed. For more than one series of results the simple median (or mean) of these differences is reported.

<sup>17</sup> The results in question in the case of Ratings as to Abstract Intelligence are for ratings made by 6 professors as to success achieved as scholar-investigator-author, the duplication of one judge in moral character and intelligence being overlooked in the comparison.



Graduates, United States, and certain results reported by Webb<sup>18</sup> for College Students, Great Britain, in the case of Ratings as to Abstract Intelligence contrasted with Reports of Educational Achievement. This change apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the mean difference between the contrasted single and mean coefficients is  $-.105$ , the second of these coefficients being lower than the first for the two series of results.<sup>19</sup> It will be observed that this finding is supported by an accordant finding in the case of the ninth factor, in which instance an analogous situation obtains. Although it probably cannot lay claim to being very significant, since it is supported by meager data and since the measures of educational achievement involved lack much of being wholly objective, this finding is of interest because the higher degree of relationship found for the subjective type of evidence under consideration is not attributable to the halo error, an error which is assumed to be present in the case of the second factor to be discussed, in which instance an indifferent result rather than the expected decrease in the degree of relationship is observed when a subjective measure of abstract intelligence with the same set of judges rating in moral character and intelligence is compared with a more or less objective measure of abstract intelligence.

(2) A change from a subjective measure of abstract intelligence with the same set of judges rating in moral character and intelligence to a more or less objective measure of abstract intelligence is involved in the results reported by Kohs and Irle and certain results reported by Kornhauser<sup>20</sup> for College Students, United States, certain results reported by Webb<sup>21</sup> for College Students, Great Britain, and the results reported by Flemming, the results reported by Fretwell, and the results reported by Kelley for School Children, United States, in the case of Ratings as to Abstract Intelligence contrasted with Reports of Educational Achievement. This change apparently tends to have an indifferent effect upon the degree of relationship, since the median difference between the contrasted single or mean coefficients is only  $+.01$ , the second of these coefficients being higher than the first for nine of the fourteen series

<sup>18</sup> The results in question are for estimates made by 2 members of college staff as to general excellence of character.

<sup>19</sup> It will be noted that a change in the type of relation is involved in one instance.

<sup>20</sup> The results in question are for average rating by instructors to whom some of students were not so well-known as to industry, a considerable difference in the number of cases represented by the contrasted results being overlooked in the comparison.

<sup>21</sup> The results in question are for estimates made by 2 prefects (fellow-students of subjects) as to impulsive kindness, tendency to do kindnesses on principle, trustworthiness, conscientiousness, pure-mindedness, and general excellence of character.

of results and lower than the first for five series. Notwithstanding, the well-known effect of the halo error, presumably operative in the case of the subjective measure described, in spite of the assumed deterrent effect of the customary use of more than one judge, might have been expected to result in a higher degree of relationship for this type of data. It is noteworthy that the findings in the case of the fourth, the sixth, the tenth, and the twelfth factors discussed support such an expectation. It should be added that a lower degree of relationship for a relatively objective measure of abstract intelligence as compared with a subjective measure of abstract intelligence is to be noted in the case of data somewhat similar in character reported by Brandenburg for College Students, United States, in Table VIII.

(3) A change from a highly selected group of college students to a less highly selected group is involved in certain results reported by Kornhauser<sup>22</sup> for College Students, United States, in the case of Ratings as to Abstract Intelligence and Ratings as to Social Intelligence. This change apparently tends to be accompanied by a slight decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.08$ , the second of these coefficients being consistently lower than the first for the three series of results. It should be noted, however, that the fact that some of the students were not so well-known to the judges in the case of the less highly selected group introduces an element of uncertainty into the interpretation of this finding. Moreover, the expected effect of the lessened restriction in range which characterizes the second group presumably would result in a contrary result to that found.

(4) A change from a subjective measure of abstract intelligence with the same set of judges rating in moral character and intelligence to a strictly objective measure of abstract intelligence is involved in the results reported by Somers for College Students, United States, certain results reported by Cady<sup>23</sup> and the results reported by Flemming for School Children, United States, and certain results reported by Webb<sup>24</sup> for School Children, Great Britain, in the case of Ratings as to Abstract Intelligence contrasted with Results of Tests of Verbal Abstract Intelligence. This change apparently tends to be accompanied by a decided decrease in the degree of relationship, since the median difference between

<sup>22</sup> The results in question are for average rating by instructors who knew students fairly well and average rating by instructors to whom some of students were not so well-known as to industry.

<sup>23</sup> The results in question are for estimate of corrigibility made by teachers who were very sure of their judgment.

<sup>24</sup> The results in question are for estimates made by 2 class-masters to whom subjects were well-known as to general excellence of character, tendency to show kindness, trustworthiness, and conscientiousness.

the contrasted mean or single coefficients is  $-.31$ , the second of these coefficients being consistently lower than the first for the twelve series of results.<sup>25</sup> Moreover, the well-known effect of the halo error, presumably operative in the case of the subjective measure described, might reasonably be expected to result in a higher degree of relationship for this type of data, although the magnitude of the error may be assumed to have been somewhat reduced by the general use of more than one judge. It is noteworthy that, although an indifferent result for the second factor discussed fails to add assurance, the findings in the case of the sixth, the tenth, and the twelfth factors considered also support this expectation.

(5) A change in the measure of moral character from a specific moral trait to a general moral trait is involved in certain results reported by Webb<sup>26</sup> for College Students, Great Britain, in the case of Ratings as to Abstract Intelligence, Ratings as to Social Intelligence, Reports of Educational Achievement, and Results of Tests of Verbal Abstract Intelligence, certain results reported by Webb<sup>27</sup> for School Children, Great Britain, in the case of Ratings as to Abstract Intelligence and Results of Tests of Verbal Abstract Intelligence, and the results reported by Stead for School Children, Great Britain, in the case of Ratings as to Social Intelligence. This change apparently tends to be accompanied by a slight decrease in the degree of relationship for one type of group and to be accompanied by an appreciable increase in the degree of relationship for another type of group, since the median difference between the contrasted mean and single coefficients is  $-.05$  for College Students, Great Britain, the second of these coefficients being lower than the first for five of the eight series of results, whereas the median difference between the contrasted mean and single coefficients is  $+.19$  for School Children, Great Britain, the second of these coefficients being consistently higher than the first for the six series of results. Nevertheless, the fact that the individual values of the coefficients for specific traits are lower than the contrasted coefficient for a general trait in fourteen of the forty instances of contrast for the eight series of results for College Students, Great Britain, and are similarly lower than the contrasted coefficient in

<sup>25</sup> It will be noted that a change in the type of relation is involved in one instance.

<sup>26</sup> The results in question are for estimates made by 2 prefects (fellow-students of subjects) as to impulsive kindness, tendency to do kindnesses on principle, trustworthiness, conscientiousness, pure-mindedness, and general excellence of character.

<sup>27</sup> The results in question are for estimates made by 2 class-masters to whom subjects were well-known as to general excellence of character, tendency to show kindness, trustworthiness, and conscientiousness, the order of the coefficients as treated in the discussion being changed from that given in the table to conform with the order of the corresponding coefficients reported by this same authority for the type of group first mentioned.

sixteen of the seventeen instances of contrast for the six series of results for School Children, Great Britain, the values of the coefficients concerned being identical in the remaining instance, raises a question as to the genuineness of the finding for the first type of group. At the same time, however, it should be noted that the finding for the type of group in question is supported by data somewhat similar in character reported by Brandenburg for College Students, United States, in Table VIII.

(6) A change from the same set of judges rating in moral character and intelligence to a different set of judges rating in the correlated traits is involved in certain results reported by Webb<sup>28</sup> for College Students, Great Britain, in the case of Ratings as to Abstract Intelligence and Ratings as to Social Intelligence, and also for School Children, Great Britain, in the former case. This change apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.13$ , the second of these coefficients being lower than the first for seven of the nine series of results.<sup>29</sup> The genuineness of the halo error, thus attested, is supported by accordant findings for the fourth, the tenth, and the twelfth factors discussed, while the second shows an indifferent effect.

(7) A difference in the degree of assurance on the part of the judges as to the accuracy of their judgments is involved in the results reported by Cady for School Children, United States, in the case of Ratings as to Abstract Intelligence. A lessened degree of assurance appears to be accompanied by a decided decrease in the degree of relationship, since the difference between the contrasted coefficients is  $-.35$  for the one series of results.

(8) A difference in the degree of acquaintance with the subjects on the part of the judges is involved in certain results reported by Webb<sup>30</sup> for School Children, Great Britain, in the case of Ratings as to Abstract Intelligence and Results of Tests of Verbal Abstract Intelligence. A lessened degree of acquaintance apparently tends to be accompanied by a slight decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.06$ , the second of these coefficients being lower than the first for three of the five series of results. It should be noted, however, that the fact that the judges rating in moral character differed from

<sup>28</sup> The results in question are for estimates made by 2 prefects (fellow-students of subjects) and estimates made by 2 members of college staff for College Students, Great Britain, and estimates made by 2 class-masters to whom subjects were well-known and 'first impression' estimates made by 2 judges for School Children, Great Britain, as to general excellence of character.

<sup>29</sup> It will be noted that a change in the type of relation is involved in one instance.

<sup>30</sup> The results in question are for estimates made by 2 class-masters to whom subjects were well-known and 'first impression' estimates made by 2 judges as to general excellence of character.

those rating in intelligence in the case of the coefficients representing a lesser degree of acquaintance in the four series of results for the first type of evidence considered introduces an element of uncertainty into the interpretation of this finding.

(9) A change from a subjective measure of abstract intelligence with a different set of judges rating in moral character and intelligence to a strictly objective measure of abstract intelligence is involved in certain results reported by Webb<sup>31</sup> for School Children, Great Britain, in the case of Ratings as to Abstract Intelligence contrasted with Results of Tests of Verbal Abstract Intelligence. This change appears to be accompanied by a noticeable decrease in the degree of relationship, since the difference between the contrasted mean and single coefficients is  $-.28$  for the one series of results. Although this finding is based upon too meager data to be regarded as significant, it gains in importance because of an accordant finding in the case of the first factor discussed, in which instance an analogous situation obtains. Furthermore, it is of similar interest because the higher degree of relationship found for the subjective type of evidence under consideration is not attributable to the halo error, although this error was presumably influential in the case of the fourth factor considered in bringing about an unduly high degree of relationship for a subjective measure of abstract intelligence with the same set of judges rating in moral character and intelligence as compared with a strictly objective measure of abstract intelligence.

(10) A change from a subjective measure of social intelligence with the same set of judges rating in moral character and intelligence to an objective measure of social intelligence is involved in certain results reported by Flemming<sup>32</sup> for School Children, United States, in the case of Ratings as to Social Intelligence contrasted with Reports of Extra-Curricular Activities. This change appears to be accompanied by an appreciable decrease in the degree of relationship, since the difference between the contrasted coefficients is  $-.11$  for the one series of results. However, the fact that the chances are only 72 in 100 that the true difference is greater than zero<sup>33</sup> gives scant reason for confidence in the genuineness of this finding. On the other hand, the well-known effect of the halo error, presumably operative in the case of the subjective measure described, might reasonably be expected to result in a higher degree of relationship for this type of data, even though several judges were

<sup>31</sup> The results in question are for 'first impression' estimates made by 2 judges as to general excellence of character.

<sup>32</sup> The results in question are for ratings by 4 teachers as to industry for an eleventh-grade group, a considerable difference in the number of cases represented by the contrasted results being overlooked in the comparison.

<sup>33</sup> This follows from the fact that  $\frac{D}{P.E._{diff.}} = .85$ .

used. It is noteworthy that, although an indifferent result for the second factor discussed fails to add assurance, the findings in the case of the fourth, the sixth, and the twelfth factors considered also support this expectation.

(11) A difference in the sex represented by the subjects is involved in the results reported by Clem<sup>34</sup> for School Children, United States, in the case of Reports of Educational Achievement, and certain results reported by Toops<sup>35</sup> for School Children, United States, in the case of Reports of Educational Achievement, Results of Tests of Verbal Abstract Intelligence, and Results of Tests of Mechanical Intelligence. The particular sex represented apparently has a slight effect upon the degree of relationship, since the median difference between the contrasted coefficients representing boys and girls is  $-.095$ , the second of these coefficients being lower than the first for fifteen of the twenty-two series of results.<sup>36</sup> It should be added, however, that the inconclusiveness of this finding is accentuated by the fact that an indifferent effect upon the results for the two sexes is to be observed in data quite different in character reported by Pearson for School Children, Great Britain, in Table VII.

(12) A change from a less objective to a more objective measure of educational achievement is involved in the results reported by Flemming and the results reported by Toops for School Children, United States, in the case of Reports of Educational Achievement. This change apparently tends to be accompanied by a decided decrease in the degree of relationship, since the median difference between the contrasted single or mean coefficients is  $-.33$ , the second of these coefficients being consistently lower than the first for the twelve series of results.<sup>36</sup> Furthermore, the well-known effect of the halo error, presumably operative to a certain extent in the case of the less objective measure described, since the teachers who assigned the ratings doubtless had a share in determining the mean school achievement mark in the first case, and the same teachers probably assigned the grades on the basis of which average conduct in school and average work in school were determined in the second case, might reasonably be expected to result in a higher degree of relationship for this type of data, although the magnitude of the error may be assumed to be partially dependent upon the number of teachers involved. It is of interest to note

<sup>34</sup> For the purposes of this discussion the order of the coefficients reported by Clem has been changed from that given in the table to conform with the order of the corresponding coefficients reported by Toops.

<sup>35</sup> The results in question represent all of the data tabulated in the case of Reports of Educational Achievement and Results of Tests of Verbal Abstract Intelligence, and are for score on Stenquist Assembly Test of Mechanical Ability in the case of Results of Tests of Mechanical Intelligence.

<sup>36</sup> It will be noted that a change in the type of relation is involved in one instance.

that, notwithstanding an indifferent result in the case of the second factor discussed, the halo error seems to have been influential in bringing about a similar finding in the case of the fourth, the sixth, and the tenth factors considered.

(13) A difference in the standard test employed as the measure of educational achievement is involved in certain results reported by Flemming<sup>37</sup> and certain results reported by Toops<sup>38</sup> for School Children, United States, in the case of Reports of Educational Achievement. The particular test employed apparently may have either an indifferent or a slight effect upon the degree of relationship, according to the test concerned, since the difference between the contrasted coefficients representing the Haggerty and the Stanford tests is  $-.05$  for the first series of results and  $+.11$  for the second series, whereas the median difference between the contrasted coefficients representing the Thorndike and the Thorndike-McCall tests is  $+.09$  for the eight series of results, the second of these coefficients being higher than the first for six series.

(14) A difference in the objective test employed as the measure of moral character is involved in certain results reported by Cady<sup>39</sup> for School Children, United States, in the case of Results of Tests of Verbal Abstract Intelligence. The particular test employed apparently may have a noticeable effect upon the degree of relationship, since the total range of the six coefficients in the series, representing six moral tests, is  $.27$ .

(15) A change in the method of expressing the test result from mental age to intelligence quotient is involved in the results reported by C. F. Chassell for School Children, United States, in the case of Results of Tests of Verbal Abstract Intelligence. This change apparently tends to be accompanied by a noticeable decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.20$ , the second of these coefficients being consistently lower than the first for the four series of results.

(16) A difference in the standard test employed as the measure of verbal abstract intelligence is involved in the results reported by Flemming for School Children, United States, in the case of Results of Tests of Verbal Abstract Intelligence. The particular test employed apparently may have either an appreciable or an indifferent effect upon the degree of relationship, according to the test concerned, since the median difference between the contrasted coefficients representing the Terman and the Miller tests is  $-.15$  for the four series of results, and between the contrasted coefficients

<sup>37</sup> The results in question are for score on Haggerty Silent Reading Test, Sigma 3 (Form A) and score on Stanford Achievement Test for a combined junior high school group.

<sup>38</sup> The results in question are for score on Thorndike Arithmetical Problem-Solving Test and score on Thorndike-McCall Reading Scale.

<sup>39</sup> The results in question are for moral test scores.

representing the Terman and the Otis tests is  $-.16$  for the four series of results, the second of these coefficients being consistently lower than the first for the eight series; whereas the median difference between the contrasted coefficients representing the Miller and the Otis tests is only  $-.04$  for the four series of results, the second of these coefficients being lower than the first for two series of results, equal to the first for one series, and higher than the first for one series.<sup>40</sup>

(17) A difference in the degree of possession of certain desirable character qualities on the part of the subjects is involved in the results reported by Raubenheimer for School Children, United States, in the case of Results of Tests of Verbal Abstract Intelligence. The selection of subjects characterized by the possession of such qualities to a relatively low degree apparently tends to be accompanied by a decided decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.36$ , the second of these coefficients being consistently lower than the first for the four series of results.<sup>41</sup>

(18) A difference in the social and educational opportunities of the subjects is involved in the results reported by Raubenheimer for School Children, United States, in the case of Results of Tests of Verbal Abstract Intelligence. The selection of subjects characterized by relatively unfavorable opportunities apparently tends to have an indifferent effect upon the degree of relationship, since the median difference between the contrasted coefficients is only  $-.035$ , the second of these coefficients being higher than the first for two of the four series of results and lower than the first for two series.<sup>41</sup>

(19) A difference in the amount of training in a moral trait is involved in the results reported by Voelker for Boy Scouts, United States, in the case of Results of Tests of Verbal Abstract Intelligence.<sup>42</sup> Special training in such a trait appears to be accompanied by a noticeable increase in the degree of relationship, since the difference between the contrasted coefficients is  $+.20$  for the one series of results.<sup>43</sup>

(20) A difference in the standard test employed as the measure of mechanical intelligence is involved in the results reported by Toops for School Children, United States, in the case of Results of Tests of Mechanical Intelligence. The particular test employed

<sup>40</sup> It will be noted that a change in the type of relation is involved in two instances in the case of the four series of results for the Terman and the Otis tests, and likewise in two instances in the case of the four series of results for the Miller and the Otis tests.

<sup>41</sup> It will be noted that a change in the type of relation is involved in one instance.

<sup>42</sup> The order of the coefficients as treated in the discussion has been reversed from that given in the table to permit a more direct method of statement.

<sup>43</sup> It will be noted that a change in the type of relation is involved in this instance.



apparently may have an appreciable effect upon the degree of relationship, since the median difference between the contrasted coefficients representing the Stenquist Assembly and the Stenquist Mechanical Aptitude tests is  $+.15$  for the four series of results, and between the contrasted coefficients representing the Stenquist Assembly and the I.E.R. tests is  $+.19$  for the four series of results, the second of these coefficients being consistently higher than the first for the eight series.<sup>44</sup>

In appraising the correlational results in process of interpretation in the light of the twenty factors considered, it should be noted that six of these factors fail to show a noteworthy effect, and that ten additional factors, although apparently of some importance in the case of the data affected, fail to suggest the influence of any constant errors upon the particular types of evidence involved; but that the fourth, the sixth, the tenth, and the twelfth factors offer significant confirmation of the importance of the halo error and show the influence which it may exercise upon the more subjective data or types of evidence, a finding which is supported by an accordant finding for one type of evidence in the case of Table VIII. Accordingly, in an evaluation of the data as a whole it is probably safe to overlook the effect of all but four of these factors, but it is necessary to keep in mind that as a result of these four factors the degree of relationship between moral character and intelligence revealed by the types of evidence in question is probably considerably too high in the case of Ratings as to Abstract Intelligence, and somewhat too high in the case of Ratings as to Social Intelligence and Reports of Educational Achievement.

A consideration of the magnitude of the coefficients represented in the analysis in relation to their probable errors (if reported)<sup>45</sup> gives the following information:

(1) Probable errors are reported for 220 of the 298 coefficients under consideration.

(2) Of these coefficients, 114 are at least four times their probable errors, 26 are at least three times their probable errors, 39 are

<sup>44</sup> It will be noted that a change in the type of relation is involved in two instances in the case of the four series for the Stenquist Assembly and the Stenquist Mechanical Aptitude tests, and in one instance in the case of the four series for the Stenquist Assembly and the I.E.R. tests.

<sup>45</sup> Only the probable errors listed in the appropriate column in Table IX are included in the present consideration. Information regarding the probable errors of several additional series of coefficients will be found in the footnotes of the table (cf. Table IX, fns. 1 and y).

at least twice their probable errors, and 41 are less than twice their probable errors, in magnitude.

(3) The total range of the 114 coefficients which are at least four times their probable errors is from  $-.24$  to  $+.85$ , and the range of all but 11 of these coefficients, from  $.21$  to  $.69$ .<sup>46</sup>

It will be noted that all but eleven of the one hundred and fourteen coefficients which are shown by the data under consideration to be sufficiently reliable to be taken as a dependable indication of real relationship point to a low or marked degree of positive correlation between moral character and intelligence. This finding loses in importance, however, because of the fact that nearly one-half of the relationships which may be regarded as satisfactorily established represent two of the least objective types of evidence considered in the research.<sup>47</sup>

A comparison between the uncorrected and the corresponding corrected coefficients of correlation for the eighty-one instances in which both are reported discloses further facts of interest, as follows:<sup>48</sup>

(1) In the case of Ratings as to Abstract Intelligence, the difference between the uncorrected and the corresponding corrected mean coefficients for College Graduates, United States, is  $+.20$  for the 2 results reported by L. M. Chassell, the corrected coefficients being more than six times their probable errors; for College Students, United States, is  $+.025$  for the 2 results reported by Folsom; for College Students, Great Britain, is  $+.11$  for the 28 results reported by Webb; and for School Children, Great Britain, is  $+.18$  for the 20 results reported by Webb.

(2) In the case of Ratings as to Social Intelligence, the difference between the uncorrected and the corresponding corrected mean

<sup>46</sup> Since certain of the coefficients under consideration are preceded by an asterisk in the table, in their present usage their sign has been changed to permit interpretation from the standpoint of the relation between moral character and intelligence.

<sup>47</sup> The proportion given represents 17 out of 43 coefficients showing a low degree, 32 out of 60 coefficients showing a marked degree, and 3 out of 10 coefficients showing a high degree of positive correlation included among the 114 coefficients which meet the standard of reliability formulated above.

<sup>48</sup> In calculating the differences between the uncorrected and the corresponding corrected mean coefficients in this discussion, a higher result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as an increase in the degree of relationship, the proper sign being prefixed.

In the instances in which the number of cases for the coefficients to be combined was not identical, the weighted mean was used in preference to the simple mean.

coefficients for College Students, Great Britain, is  $+.10$  for the 7 results reported by Webb.

(3) In the case of Reports of Educational Achievement, the difference between the uncorrected and the corresponding corrected mean coefficients for College Graduates, United States, is  $+.10$  for the 2 results reported by L. M. Chassell; and for College Students, Great Britain, is  $+.15$  for the 7 results reported by Webb.

(4) In the case of Reports of Extra-Curricular Activities, the difference between the uncorrected and the corresponding corrected coefficient for College Students, United States, is  $+.03$  for the 1 result reported by Folsom.

(5) In the case of Results of Tests of Verbal Abstract Intelligence, the difference between the uncorrected and the corresponding corrected mean coefficients for College Students, Great Britain, is  $+.01$  for the 7 results reported by Webb; and for School Children, Great Britain, is  $+.06$  for the 5 results reported by Webb.

These facts indicate that the relation between moral character and intelligence as revealed by the data under consideration tends to be slightly or appreciably increased by taking into account chance inaccuracies in the original measures.

A comparison between the zero order uncorrected and the corresponding first order coefficients of correlation in the nine instances in which the latter are reported likewise reveals additional facts of interest, as follows:

(1) In the case of Ratings as to Abstract Intelligence, for School Children, United States, a coefficient of  $.64$ , representing the correlation between ratings by 4 teachers as to industry and similar ratings as to intelligence, reported by Flemming, becomes  $.57$  if score on the Terman Group Mental Test, Form B, is held constant, and  $.10$  if teachers' estimate of school attitude is held constant.

(2) In the case of Reports of Educational Achievement, for School Children, United States, a coefficient of  $.69$ , representing the correlation between ratings by 4 teachers as to industry and mean school achievement mark, reported by Flemming, becomes  $.37$  if teachers' estimate of intelligence is held constant,  $.63$  if score on the Terman Group Mental Test, Form B, is held constant,  $.15$  if teachers' estimate of school attitude is held constant,  $.62$  if teachers' estimate of physical energy is held constant, and  $.23$  if teachers' estimate of desire to excel is held constant.

(3) In the case of Results of Tests of Verbal Abstract Intelligence, for School Children, United States, a coefficient of  $.38$ , representing the correlation between ratings by 4 teachers as to industry and score on the Terman Group Mental Test, Form B, reported by Flemming, becomes  $-.14$  if teachers' estimate of intelligence is

held constant, and  $-.06$  if teachers' estimate of school attitude is held constant.

Although the facts presented in the foregoing comparison are too meager to permit the formulation of definite conclusions, particularly in view of the fact that no probable errors are reported for the first order coefficients tabulated, they suggest the indirect effect upon the degree of correlation of factors which the usual type of correlational analysis fails to take into account.

In summary, then, it may be said that product-moment coefficients of correlation between measures of moral character and intelligence point to a direct relation between morality and intellect which, although extremely variable, tends to be low in non-delinquent groups in English-speaking countries. At the same time, a critical examination of the coefficients with reference to various factors apparently indicates on the one hand that the degree of relationship revealed by the more objective data or types of evidence does not require qualification as a result of their effect; and on the other hand, by reason of the apparent effect of the halo error implicit in several of the factors considered upon the less objective data or types of evidence, that the degree of relationship revealed is probably too high in the case of Ratings as to Abstract Intelligence, Ratings as to Social Intelligence, and Reports of Educational Achievement. A consideration of the magnitude of the coefficients in relation to their probable errors, however, serves to emphasize the finding of a low or marked degree of relationship between the qualities investigated. Moreover, a comparison between the uncorrected and the corresponding corrected coefficients of correlation indicates that the degree of relationship tends to be slightly or appreciably increased by taking into account chance inaccuracies in the original measures. It should be further noted that a comparison between the zero order uncorrected and the corresponding first order coefficients of correlation suggests the indirect effect upon the degree of relationship of factors not usually considered.

## CHAPTER X

### A SYNTHESIS OF STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE

AS IN the case of studies of the relation between delinquency and mental inferiority, the detailed information included in the preceding tabular review of correlational studies of the relation between moral character and intelligence is doubtless of more value than any compilation of the data which a synthesis of these studies might present. And yet, as in the former instance, a summary of the findings of these studies will afford an opportunity for formulating general conclusions as to the relation between moral character and intelligence, and hence as to the relation between morality and intellect, which the detailed findings cannot give. Accordingly, this chapter provides a synthesis of studies of the relation between moral character and intelligence.

The necessary data for the present synthesis will be found in Table XXVIII, which presents a comparison of the three parts of the research as to correlational results, and in Table XXIX, which presents a compilation of the correlational results of investigations of the relation between morality and intellect.<sup>1</sup> These tables together preserve intact the combined results of studies of the relation between moral character and intelligence summarizing the individual results tabulated in the present division of the research.<sup>2</sup> For the sake of convenience the data referred to are reproduced in the following tabulation:<sup>3</sup>

<sup>1</sup> Owing to the fact that the compilation of studies of the relation between moral character and intelligence included in the compilation cited above combines the results for Parts II and III with those for Part I B in those instances in which identical types of evidence, types of groups, countries, and types of coefficients are concerned, whereas the comparison cited above gives the results for the three parts of the research separately in the instances in which a comparison of results is possible, reference is made to both tables.

<sup>2</sup> An explanation of the method of combining coefficients of correlation for all types of subjects will be found in Chapter XXXI.

<sup>3</sup> A frequency distribution of the coefficients included in this compilation of correlational results for Part I B will be found in Appendix IV, Section 2.

Type of Group and Country	Total Popu- lation <sup>a</sup>	No. and Type of Coeffi- cients	Correlational Results	
			Single Coefficient, Weighted Mean, or Weighted Quartile Points <sup>b</sup> (Median <sup>c</sup> or $Q_1$ and $Q_3$ )	
RATINGS AS TO INTELLIGENCE				
<i>Ratings as to Abstract Intelligence</i>				
General Population				
Great Britain . . . . .	[2,000]	2 $r_t$		.72
Royalty				
Europe . . . . .	608	1 $r_t$		.34
Aviation Cadets				
United States . . . . .	137	1 $r$		.64
College Graduates				
United States . . . . .	197	2 $r$		.40
College Students				
United States . . . . .	1,194	42 $\rho$		.52
	2,342	20 $r$	.52	.64
Great Britain . . . . .	5,432	28 $r$		.27
School Children				
United States . . . . .	[4,641]	16 $r$	.65	.75
Great Britain . . . . .	4,023	2 $r_t$		.45
	[100]	1 $\rho$		.76
	2,800	20 $r$		.44
<i>Ratings as to Social Intelligence</i>				
College Students				
United States . . . . .	398	14 $\rho$		.52
	1,332	14 $r$	.43	.62
Great Britain . . . . .	1,358	7 $r$		.25
School Children				
United States . . . . .	1,100	6 $r$	.46	.71
Great Britain . . . . .	405	3 $r$		.22
REPORTS OF EDUCATIONAL STATUS				
<i>Reports of Amount of Schooling</i>				
College Students				
United States . . . . .	480	2 $r$		.28 <sup>d</sup>
School Children				
United States . . . . .	[100]	1 $r$		.02
<i>Reports of School Progress</i>				
School Children				
United States . . . . .	448	4 $r$	.19	.27
<i>Reports of Educational Achievement</i>				
College Graduates				
United States . . . . .	167	2 $r$		.22
College Students				
United States . . . . .	174	6 $\rho$		.35
	1,829	11 $r$	.30	.71
Great Britain . . . . .	104	1 $\rho$		.60 <sup>e</sup>
	1,358	7 $r$		.50

Type of Group and Country	Total Popu- lation <sup>a</sup>	No. and Type of Coeffi- cients	Correlational Results	
			<i>Single Coefficient,</i> <i>Weighted Mean, or</i> <i>Weighted Quartile Points<sup>b</sup></i> ( <i>Median<sup>c</sup> or Q<sub>1</sub> and Q<sub>3</sub></i> )	

*Reports of Educational Achievement (Concluded)*

School Children				
United States .....	[5,248]	54 r	.20 ...	.44

## REPORTS OF EXTRA-CURRICULAR ACTIVITIES

College Students				
United States .....	76	1 r		.32
School Children				
United States .....	115	3 r	*.27	

## RESULTS OF INTELLIGENCE TESTS

*Results of Tests of Verbal Abstract Intelligence*

College Students				
United States .....	1,032	6 r	.01 <sup>f</sup>	
Great Britain .....	1,358	14 r	.09 <sup>g</sup>	
School Children				
United States .....	87	3 p	.29	
	[5,822]	53 r	.20 ...	.33
Great Britain .....	700	5 r	.11	
Boy Scouts				
United States .....	38	2 r	.03	

*Results of Tests of Mechanical Intelligence*

School Children				
United States .....	1,506	16 r	.02 ...	.21

<sup>a</sup> The number tabulated is the gross number of cases represented by all the coefficients opposite the number in question, regardless of any duplication that may have occurred in the subjects for these coefficients.

The numbers in brackets were supplied in whole or in part in accordance with a routine procedure, which required that a reasonable population be inferred from the nature of the subjects for the group in question in those instances in which the number of cases for a particular group was not given in the original source.

<sup>b</sup> The method of weighting used was quantitative. The weight applied to each coefficient corresponded to the number of cases represented by the coefficient in question, this number being taken as the frequency of that coefficient in the calculation of the weighted mean (or of the weighted quartile points in those instances in which the heterogeneity of the groups to be combined failed to justify the calculation of a weighted mean).

<sup>c</sup> A weighted median is distinguished from a weighted mean by an asterisk.

<sup>d</sup> In spite of the heterogeneity of the groups combined, the weighted mean was substituted for the weighted median in this instance because the number of coefficients was only two.

<sup>e</sup> Since the corresponding uncorrected coefficient was not reported in the original source, the corrected coefficient is given in this instance.

<sup>f</sup> The low result in this instance is due to the fact that, although 5 of the 6 coefficients combined ranged from .17 to .35, a single coefficient of -.35 was represented by a population of 450, whereas the combined population of the 5 positive coefficients was only 582.

<sup>g</sup> Since the corresponding uncorrected coefficients were not reported in the original source, 7 corrected coefficients are included in the weighted mean given in this instance.

A compilation of the correlational results of studies of the relation between moral character and intelligence as given in the foregoing tabulation may be interpreted briefly as follows:

The correlation between moral character and intelligence as found in the case of non-delinquent groups is clearly positive, and tends to be low or marked in degree.

In conclusion, therefore, it may be stated that the evidence as to the relation between moral character and intelligence presented in Part IB of the research varies considerably, but indicates that a direct and low or marked relation exists between morality and intellect among non-delinquent groups in this country and abroad.

In comment upon this conclusion, however, it should be pointed out that various extraneous and selective factors have entered in to affect the degree of relationship found.<sup>4</sup> Notable among these factors is the halo error. Since the total effect of the factors considered has probably been to raise the results obtained, the true relation between morality and intellect in accurately measured, generally restricted groups of the types investigated is presumably lower than these results indicate. At the same time, it is hardly probable that the relation is negligible. Hence the conclusion is apparently justified that there is a direct and low relation between morality and intellect among non-delinquent groups in this country and abroad.

<sup>4</sup> Attention has already been called to the influence of such factors in the detailed interpretations of the individual tables in the preceding chapter. The matter is further discussed in a consideration of various factors which affect the correlational results of the research, including an analysis of the effect of different types of subjects, an analysis of the effect of different types of evidence, types of groups, countries, and types of coefficients, and an analysis of the effect of chance inaccuracies in the original measures, to which Chapter XXXII will be devoted.



PARTS II AND III

REPORTS OF TWO INVESTIGATIONS OF THE  
RELATION BETWEEN MORALITY AND  
INTELLECT BY THE AUTHOR

PART II

AN INVESTIGATION OF THE RELATION  
BETWEEN MORAL AND INTELLECTUAL TRAITS



## CHAPTER XI

### AN EXPLANATION OF THE GENERAL PLAN FOLLOWED IN STUDIES OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS

THE principal considerations in the general organization of subject matter in Part II were the need for orientation in the division of the research concerned with the relation between moral and intellectual traits, the necessity for a detailed account of the several studies undertaken in attacking this problem, and the desirability of relating the subject matter presented in this division of the research with that presented in preceding divisions. Accordingly, the present chapter supplies an explanation of the general plan followed in studies of the relation between moral and intellectual traits, whereas the succeeding chapters offer a tabular review of the investigation of the relation between moral and intellectual traits, a detailed account of the principal study included in the investigation under the heading *A Study of the Correlation between Ratings in Moral and Intellectual Traits*, a detailed account of the two supplementary studies included under the heading *Studies of the Correlation between Ratings in Moral and Intellectual Traits and Objective Measures of Intelligence*, and a synthesis of the investigation of the relation studied.

The explanation given in the two sections of this chapter describes the determination of the main outlines of the investigation of the relation between moral and intellectual traits, and the supplementation of the principal study.

#### SECTION I

##### THE DETERMINATION OF THE MAIN OUTLINES OF THE INVESTIGATION OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS

The determination of the main outlines of the investigation

involved in turn the selection of the method, the selection of the subjects and the judges, and the selection of the traits.

### *The Selection of the Method*

An ideal approach to the study of the relation between morality and intellect would be to choose a thousand or more individuals at random from the total population and to administer adequate objective tests of morality and of intellect to this group.

In an investigation of the relation between morality and intellect which is to be reported in Part III the author found it possible to utilize reliable measures of morality and intellect. At the time the study to be reported in this section was initiated, however, an adequate measure of moral character did not exist—and indeed is probably yet to be devised. Furthermore, group tests of intelligence were still in their infancy, for the stimulus of Army necessity had not as yet precipitated the development of the valuable tests of this type now available, and adequate individual tests of the intelligence of normal persons, then but recently standardized, had not yet come into general use. Consequently, in the early approach to the problem under consideration a method of investigation which did not require objective measures was determined upon. This was the well-known order of merit, or rank order, method, so adapted as to be applicable to an investigation of the relation between moral and intellectual traits.

The order of merit method, which was first given definite formulation by Cattell, was utilized at an early date by Sumner in a statistical study of belief, published in 1898 (187), and was first applied to ratings by associates by Cattell in his statistical study of American men of science,<sup>1</sup> a report of which appeared in 1903 (131). It was subsequently employed, among others,<sup>2</sup> by Norsworthy, who in 1908 demonstrated the validity of judgments of character made by the order of merit method (170).

As applied to the present investigation, the order of merit method calls for the ranking by their associates of designated persons in respect to appropriate traits.

<sup>1</sup> Consult the statements by H. L. Hollingworth (146, p. 97), by Cady (130, p. 232), and by the Committee on Character Education of the National Education Association (167, p. 38).

<sup>2</sup> Notably Hollingworth, who made a critical study and compiled a bibliography of the order of merit method as early as 1913 (146, pp. 96-119).

*The Selection of the Subjects and the Judges*

A major requirement of the order of merit method as applied to an investigation of the correlation between traits at once suggests itself. This is the necessity of selecting as subjects in the investigation relatively small groups of individuals well known to the prospective judges in respect to the traits selected for rating.

It is evident that senior classes in the smaller institutions of higher learning meet the needs of the method admirably. Thus the members of these groups customarily number considerably under one hundred. Moreover, they are usually well known to their instructors and to their fellow students, so that these persons may be called upon to act as judges. Lastly, judges drawn from a college population, whether faculty or student, are likely to be of superior intelligence.

These among other considerations resulted in the selection of the members of the senior class in colleges and universities with small enrollments as the prospective subjects for the investigation, and of their instructors and fellow students as the prospective judges.

*The Selection of the Traits*

Especially in the case of the moral qualities, many desirable traits claimed attention as profitable for study in connection with the investigation. The fact that busy faculty members were to be asked to serve as judges, however, constituted a very practical necessity for limiting the number of traits in respect to which ratings were to be requested. The selection of appropriate moral traits was thus one of the early problems of the research.

Since it appeared probable that any moral traits selected for use in the study should be qualified with reference to some specific situation in which the trait might be manifested, two preparatory lists were utilized: the first consisted of relations involving moral responses; the second, of traits indicative of morality.

The list of relations involving moral responses was constructed by the author in consultation with others, and is as follows:

## RELATIONS INVOLVING MORAL RESPONSES

Self	Local community	Education
Family	State	Religion
Friends	Nation	Vocation
Helpers	World at large	Leisure time
Foreigners	Industrial world	Animals

This list was submitted for criticism to a class in educational statistics in Teachers College, Columbia University, with the following questions and directions:

1. Are these relations too general to be of value in applying to individual responses?
2. Mark those which seem to you good, G; medium, M; poor, P; worthless, W.
3. If you had to strike out one, what one would you consider of least value?
4. What additional relations or more suggestive categories do you think of?

Eleven students classified the relations involving moral responses. Although the method used differed somewhat from that specified in the directions in a number of cases, all but one of the papers received could be utilized in a joint summary.

Several of the students thought a part or all of the relations too general to be of value in applying to individual responses, or spoke of the necessity of qualifying them in some way.

In general, the relations marked good by these students were Self, Family, Friends, Helpers, Local community, and Leisure time, good or medium, Industrial world, and medium, Foreigners, State, Nation, World at large, and Education; while those marked poor by the largest number of students were Education, Religion, and Vocation, and those marked worthless by as many as two students were State and Animals. The last-named relation was also the one struck out as of least value by the largest number of students.

A number of additional relations or more suggestive categories were proposed by various students, supplementing the list submitted or tending to make it more concrete.

The list of relations involving moral responses proved to be of limited usefulness in the selection of appropriate traits for use in the investigation. In this respect it was much less important than the second preparatory list, which will now be described.

The list of traits indicative of morality was constructed by the author from a collection of approximately one hundred traits gathered by her from various sources. Among traits used in other investigations or named in the literature, the collection particularly included "the 'cardinal virtues' of moral theory" which Dewey names as essential to all morality (cf. 138, pp. 404-05). The ex-

clusion of various synonyms left a list of forty-one traits, as follows:

TRAITS INDICATIVE OF MORALITY

Perseverance	Prudence
Honesty	Reliability
Mental balance	Socialization
Justice	Highmindedness
Piety	Conscientiousness
Unselfishness	Tolerance
Kindliness	Adaptability
Courage	Conviction
Regard for personality	Willingness to forgive
Self control	Love
Good will	Thoughtfulness
Temperance	Obedience
Activity for social welfare	Vigor
Loyalty	Mannerliness
Personal purity	Fortitude
Sociability	Carefulness
Self-realization	Ambition
Goodness	Self-reliance
Achievement relative to ability	Generosity
Sympathy	Humaneness
Industriousness	

These traits were submitted for further elimination to the class in educational statistics already referred to, with the following directions:

1. Rank these terms from 1 to 41 according to the value you think they have as names of traits indicative of morality, letting 1 stand for the best term, 2 for the next best, and so on.

2. By utilizing the relations given in the previous list and any others you may suggest, indicate the ten most significant and inclusive responses you can think of as criteria for judging morality.

Fourteen students ranked a part or all of the traits indicative of morality. Of these returns, eight were received in time and were sufficiently complete to be combined in order to provide a guide list for the selection of traits for use in the investigation. To permit a comparison between the ratings by these eight students and the twelve students who eventually submitted complete (or practically complete) ratings, however, the ratings by the twelve students were subsequently combined. Although the two series of ranks indicating the relative order of merit of the various traits

as adjudged by the initial group of eight and the larger group of twelve students frequently differed by several points, the first twenty-two traits in the two lists were the same, as the following tabulation shows:

Rank (8)	Order (12)	Name of Trait	Rank (8)	Order (12)	Name of Trait
1	7.5	Love	13	11	Industriousness
2	4	Unselfishness	14.5	7.5	Personal puri- ty
3	9	Highmindedness	14.5	13	Kindliness
4	2	Self control	16	14.5	Sympathy
5.5	3	Justice	17	14.5	Temperance
5.5	12	Good will	18	18	Regard for per- sonality
7	1	Reliability	19	22	Tolerance
8	16.5	Activity for so- cial welfare	20	19	Willingness to forgive
9	6	Honesty	21	16.5	Thoughtfulness
10.5	10	Generosity	22	21	Humaneness
10.5	20	Loyalty			
12	5	Courage			

Since special pains was taken in the construction of the list of forty-one traits to include the so-called cardinal virtues of moral theory already referred to, it is of interest to note that four of the terms used by Dewey, namely, *love*, *justice*, *courage*, and *temperance*, are included in this partial list of twenty-two traits receiving the highest ratings, and three others, namely, *conscientiousness*,<sup>3</sup> *fortitude*, and *vigor*, were placed among the lowest half of the list of forty-one traits, the last mentioned term being assigned one of the lowest ratings in the entire list.<sup>4</sup>

The list of traits indicative of morality proved to be of considerable usefulness in the selection of appropriate traits for rating by the prospective student judges.

Nine of the students who ranked the traits indicative of morality also prepared lists of significant and inclusive responses as criteria for judging morality, the number suggested by individual students ranging from six to eleven. In spite of the fact that a

<sup>3</sup> Another term used by Dewey, *wisdom*, was not included in the list, *conscientiousness* being given as the modern phrase (cf. 138, p. 405).

<sup>4</sup> It is of course recognized that the cardinal virtues named were not selected with reference to the particular needs of an investigation concerned with the relation between morality and intellect. The results of this cursory study, however, apparently point to the desirability of some experimental determination of any traits which are expected to be used in research of this character.



large proportion of the responses suggested were based on the two preparatory lists which had been placed in their hands, a wide variety of responses was named, a number of which could be utilized as criteria for judging morality either in college students or among people in general.

At the time the two preparatory lists were submitted to the students for criticism, as a means of eliciting further suggestions for enriching the investigation a number of additional requests were presented. The most fruitful of these, judged by the returns received, was a request that the students make out a list of acts which they would regard as symptomatic of morality in college students. In response to this request six students formulated lists which proved to be of considerable interest.

The papers received from these students in the class in educational statistics were supplemented by five papers, including both acts and ideals symptomatic of morality in college students, prepared by members of a class in educational psychology. Of these, three gave evidence of genuine discrimination between acts and ideals and were of definite interest.

Although it did not prove possible in the present investigation to make systematic use of the responses which might be taken as criteria for judging morality nor of the acts and ideals symptomatic of morality in college students listed by the members of these two classes, a considerable part of this material was utilized soon after it was collected in an informal report on the ethics of college students.

The final selection of the traits for use in the investigation took into account three general requirements: first, that the traits be ones in which the subjects could be easily judged, secondly, that they be ones with reference to which the judges would be willing to judge, and thirdly, that they be fairly comprehensive.

With these requirements in mind, a list of seven moral traits suitable for rating by student judges was selected, the twenty traits receiving the highest ratings as indicative of morality on the basis of the judgments of eight students serving as a guide in the selection. The traits thus selected are given below:

Unselfishness	Courage in Support of Convictions
Loyalty to School and Friends	Self-Control
Justice to All	Activity for Social Welfare
	Reliability

It will be noted that these traits are all to be found in the guide list of twenty receiving the highest ratings, but that a number of them have been qualified for the sake of clarity or ease in rating.

For the purpose of rating by faculty judges prudence suggested the desirability of requesting ratings in a single moral trait as far as possible in keeping with the requirements outlined above. The one determined upon was the following:

#### Morality in the Broadest Sense

The selection of appropriate intellectual traits did not prove to be so difficult a problem as the selection of appropriate moral traits. The intellectual abilities of college students are generally displayed in two ways: first, in relation to their studies, and secondly, in relation to student activities. In keeping with this fact two intellectual traits suitable for use in the rating by both faculty and student judges were selected, as follows:

Intellect as Shown in  
Studies

Intellect as Shown in Activi-  
ties Other than Studies

The three traits thus selected for faculty judges and the nine traits thus selected for student judges were entered with appropriate instructions on the rating blanks for faculty and student judges, as shown on the following page.

## SECTION 2

### THE SUPPLEMENTATION OF THE PRINCIPAL STUDY

From the information already given in this chapter, the main outlines of the investigation of the relation between moral and intellectual traits are apparent. Ratings of college or university seniors by members of the faculty and by their fellow students in respect to the moral and intellectual traits specified, constituted the material for the principal study undertaken in the investigation.

Because of the inevitable subjectivity of ratings by the order of merit method, however, two supplementary studies were undertaken. These studies utilized relatively objective data as analogous measures to the two intellectual traits used in the principal study; namely, records of college marks, analogous to ratings in *Intellect*

## RATING BLANK FOR FACULTY JUDGES

**INSTRUCTIONS:** Without consulting with anyone, please rank the students whose names appear below in the traits indicated, letting 1 stand for the possession of the highest degree of the trait in question as compared with the group as a whole, 2 for the possession of the next highest degree, and so on. First, however, check the names of any students whom you feel that you do not know sufficiently well to grade fairly, and omit them from the ranking. Please return the sheet to the person from whom you received it within three days, if possible. Subsequently a comparison of your rankings with those made by other judges will be sent to you.

Morality in the Broadest Sense	Intellect as Shown in Studies	Intellect as Shown in Activities Other than Studies
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
59	59	59
60	60	60
61	61	61
62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

Names of Students:

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### RATING BLANK FOR STUDENT JUDGES

INSTRUCTIONS: Examine the list of names below. Select the person in the group whom you consider the most unselfish of all, and give him (or her) a rank of 1 in the column under "Unselfishness." Then select the one whom you consider the next most unselfish, and give him a rank of 2. Then give a rank of 3 to the third most unselfish person; and so on until you have ranked all whom you know. Then do the same for "Loyalty to School and Friends." Then do the same for "Justice to All"; and so on until all the columns are filled. Your rankings will be kept *absolutely confidential*. You need not sign your name unless you care to. No improper, unfair, or public use will be made of your rating of any individual.

Unselfishness	Loyalty to School and Friends	Justice to All	Courage in Support of Convictions	Self-Control	Activity for Social Welfare	Reliability	Intellect as Shown in Studies	Intellect as Shown in Activities Other than Studies
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Names of Students:

[illegible]

as *Shown in Studies*, and reports of extra-curricular activities, analogous to ratings in *Intellect as Shown in Activities Other than Studies*.

Since satisfactory objective data for utilization as an analogous measure to ratings in *Morality in the Broadest Sense* failed to present themselves in this investigation, a supplementary study in the case of this trait was impossible. As stated earlier in this chapter, however, the measures utilized in the investigation reported in Part III included reliable measures of morality.

## CHAPTER XII

### A TABULAR REVIEW OF THE INVESTIGATION OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS

THE consistent utilization throughout this volume of a uniform tabular method of report, adapted to the different types of studies presented, at this point calls for a tabular review of the results of the original investigation which is reported in this division of the research. Such a representation of the investigation as a whole provides in convenient and comparable form the evidence as to the relation between moral and intellectual traits, and thus as to the relation between morality and intellect, afforded by the studies included. Accordingly, Table X presents a tabular review of the investigation of the relation between moral and intellectual traits.<sup>1</sup>

The table contains the routine information required in a tabular review of correlational studies in non-delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case the number of coefficients and the weighted median or mean for the rank-difference coefficients of correlation reviewed, this result being given in turn for the mean of the alternate coefficients, weighted quantitatively, and for the corrected coefficients, weighted both quantitatively and qualitatively.

The major and minor types of evidence as to the relation between moral and intellectual traits contributed by the data tabulated are listed following the table.

<sup>1</sup> A frequency distribution of the coefficients showing the degree of relationship found between moral character and intelligence, including the most significant correlational results presented in Part II, which are identical with those represented in this review, will be found in Appendix IV, Section 2. In this distribution the results for the principal study and the two supplementary studies are analyzed by types of evidence, and may be identified by the numbers of the tables as given in the analysis.

TABLE X\*  
A TABULAR REVIEW OF THE INVESTIGATION OF THE RELATION  
BETWEEN MORAL AND INTELLECTUAL TRAITS

AUTHORITY	DATE OF INVESTIGATION	GROUP	No. of Cases	MEASURES		RANK-DIFFERENCE COEFFICIENTS OF CORRELATION			
				MORAL CHARACTER	INTELLIGENCE	NO. OF COEFFICIENTS <sup>a</sup>	MEAN OF ALTERNATE	CORRECTED	
							WEIGHTED MEDIAN OR MEAN <sup>b,c</sup>	QUANTITATIVE	QUALITATIVE
NON-DELINQUENT									
RATINGS AS TO INTELLIGENCE									
RATINGS AS TO ABSTRACT INTELLIGENCE									
Chascll (Part II)	1917-1918	COLLEGE STUDENTS <i>United States</i> Members of senior class in institutions of higher learning <sup>d</sup> Institutions 1, 2, 9, 11, 12, 14, 15, 16, 19, 20, 21, 22, 23, 25, 26, 28 <sup>e</sup> Institutions 9, 10, 21, 22, 28	498	Rankings by from 2 to 6 members of faculty in morality in broadest sense Rankings by from 6 to 37 fellow students <sup>f</sup> in Unselfishness Loyalty to school and friends Justice to all Courage in support of convictions Self-control Activity for social welfare Reliability	Rankings by from 2 to 6 members of faculty in intellect as shown in studies Rankings by from 6 to 31 fellow students <sup>f</sup> in intellect as shown in studies	14 25 3 5 3 3 4 4 3	.41 .28	.67 .65	.66 .49 .37 .44 .57 .57 .80 .56 .47

152	Institutions 9, 16, 21, 22, 28	1917-1918	1935	152	Composite of rankings by from 6 to 37 fellow students in unselfishness, loyalty to school and friends, justice to all, courage in support of convictions, self-control, activity for social welfare, and reliability	Rankings by from 6 to 31 fellow students' in intellect as shown in studies	4	.37	.71	.70
COLLEGE STUDENTS										
United States										
Chasell (Part II)	1917-1918	1935	Members of senior class in Institutions of higher learning <sup>d</sup> Institutions 1, 2, 9, 11, 12, 14, 15, 16, 19, 20, 21, 22, 23, 25, 26, 28 <sup>e</sup> Institutions 9, 16, 21, 22, 28	365	Rankings by from 2 to 6 members of faculty in morality in broadest sense Rankings by from 6 to 37 fellow students' in Unselfishness Loyalty to school and friends Justice to all Courage in support of convictions Self-control Activity for social welfare Reliability Composite of rankings by from 6 to 37 fellow students' in unselfishness, loyalty to school and friends, justice to all, courage in support of convictions, self-control, activity for social welfare, and reliability	Rankings by from 2 to 5 members of faculty in intellect as shown in activities other than studies Rankings by from 6 to 30 fellow students' in intellect as shown in activities other than studies Rankings by from 6 to 30 fellow students' in intellect as shown in activities other than studies Rankings by from 6 to 30 fellow students' in intellect as shown in activities other than studies	10 25 4 4 4 3 4 4 2 5	.42 .37        .27	.65 .74        .75	.60 .73 .16 .43 .43 .77 .77 .81 .90 *.64 .72
RATINGS AS TO SOCIAL INTELLIGENCE										
RATINGS AS TO ABSTRACT AND SOCIAL INTELLIGENCE										
COLLEGE STUDENTS										
United States										
Chasell (Part II)	1917-1918	1935	Members of senior class in Institutions of higher learning <sup>d</sup> Institutions 9, 16, 21, 22, 28 <sup>e</sup>	144	Rankings by from 2 to 5 members of faculty in morality in broadest sense	Composite of rankings by from 3 to 6 members of faculty in intellect as shown in studies and intellect as shown in activities other than studies	5	.40	.47	.54

\* The footnotes to Table X will be found on page 213.

TABLE X (Concluded)

NON-DELINQUENT										
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. of Cases	MEASURES		RANK-DIFFERENCE COEFFICIENTS OF CORRELATION			
					MORAL CHARACTER	INTELLIGENCE	NO. OF COEFFICIENTS <sup>a</sup>	MEAN OF ALTERNATE	CORRECTED	
								WEIGHTED MEDIAN OR MEAN <sup>b,c</sup>	WEIGHTED MEDIAN OR MEAN <sup>b,c</sup>	QUANTITATIVE
Chasell ( <i>Cont.</i> )			Institutions 9, 16, 21, 22, 28	152	Composite of rankings by from 6 to 37 fellow students in unselfishness, loyalty to school and friends, justice to all, courage in support of convictions, self-control, activity for social welfare, and reliability	4	.36	.81	.80	
REPORTS OF EDUCATIONAL STATUS										
REPORTS OF EDUCATIONAL ACHIEVEMENT										
Chasell (Part II)	1917-1918	1935	COLLEGE STUDENTS  <i>United States</i> Members of senior class in institutions of higher learning <sup>d</sup> Institutions 1, 9, 12, 16, 19, 20, 22, 23 <sup>e</sup>	236	Rankings by from 2 to 6 members of faculty in morality in broadest sense	8	.45	.60	.60	



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<sup>a</sup> Since the routine uncorrected coefficients used in this investigation were calculated between alternate halves of the data, and since a mean of the resulting alternate coefficients was taken as the most satisfactory figure for comparative purposes, the figure given represents the actual number of these mean coefficients, and at the same time represents the actual number of the corresponding corrected coefficients, barring however pertinent coefficients excluded in the interpretations of the individual tables and in the compilations of correlational results because the data involved failed to meet certain requirements as to reliability and consistency formulated in the course of the investigation.

It will be noted that the numbers in italics are the totals of the number of coefficients for the separate traits, and that the weighted median coefficients corresponding to these figures are also italicized.

<sup>b</sup> The method of weighting used in the tabular review was quantitative in the case of the mean of the alternate coefficients, and both quantitative and qualitative in the case of the corrected coefficients. The quantitative weight applied to each coefficient corresponded to the number of cases represented by the coefficient in question, this number being taken as the frequency of that coefficient in the calculation of the weighted median or mean. The qualitative weight applied to each coefficient, on the other hand, corresponded to the final grade assigned to the ratings submitted by the faculty or the student judges for the institution in question, this value in turn being taken as the frequency of that coefficient in the calculation of the weighted median or mean.

<sup>c</sup> A weighted mean is distinguished from a weighted median by an asterisk.

<sup>d</sup> Of the sixteen selected institutions represented in the table, fifteen were four-year colleges of liberal arts or universities represented in the research by colleges of this type, one of the universities, however, being represented by its three other colleges as well; and the sixteenth was a junior college also of the liberal arts type.

To avoid confusion, all of the institutions represented by a particular type of data are indicated in each case, in spite of the fact that the coefficients representing one or more institutions were frequently excluded from consideration because of the unsatisfactory quality of the data involved. Except in the case of the italicized figures, which represent five institutions in every case, the actual number of institutions represented by a given result is the same as the number of coefficients corresponding to that result, as given in the table.

<sup>e</sup> A key to the institutions coöperating in the investigation of the relation between moral and intellectual traits is given in Appendix II, Section I.

<sup>f</sup> The student judges in the investigation were principally seniors.

RATINGS AS TO INTELLIGENCE: Ratings as to Abstract Intelligence, Ratings as to Social Intelligence, Ratings as to Abstract and Social Intelligence.

REPORTS OF EDUCATIONAL STATUS: Reports of Educational Achievement.

REPORTS OF EXTRA-CURRICULAR ACTIVITIES.

The following type of group is represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: College Students.

The following country is likewise represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: United States.

The tabular review of the investigation of the relation between moral and intellectual traits presented in Table X affords fairly consistent evidence of a positive correlation between moral character and intelligence, and hence of a positive correlation between morality and intellect.

A further interpretation of the evidence as to these relationships will follow the presentation and the compilation of the correlational results as given in succeeding chapters.

# *A STUDY OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS*

## CHAPTER XIII

### A PRELIMINARY SURVEY OF THE STUDY OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS

THIS chapter and the six succeeding chapters are devoted to a detailed account of the principal study included in the investigation of the relation between moral and intellectual traits. The present chapter affords a preliminary survey of the study of the correlation between ratings in moral and intellectual traits; the next five chapters provide in order an account of the procuring of the data, an analytical study of the cooperating institutions and of the persons who served as subjects or judges, an analytical study of the returns, an account of the statistical treatment of the data, and an explanation of the evaluation of the data; while the remaining chapter combines the presentation and interpretation of the correlational results for ratings by faculty and student judges.

The preliminary survey offered in the two sections of this chapter includes a summary of the returns received from faculty and student judges, and a concrete description of the typical institutions contributing to the conclusions of the study.

#### SECTION I

##### A SUMMARY OF THE RETURNS RECEIVED FROM FACULTY AND STUDENT JUDGES<sup>1</sup>

The complete returns obtained from all cooperating institutions in the study of the correlation between ratings in moral and in-

<sup>1</sup>The figures upon which this discussion is based were derived from the

tellectual traits consisted of 8,143 ratings received from twenty-eight institutions submitted by 110 faculty judges for 1,229 students, and 16,303 ratings received from eight institutions submitted by 106 student judges for 292 students. Of these returns, 6,871 ratings submitted by 99 faculty judges for 801 students and 14,932 ratings submitted by 91 student judges for 218 students were retained in the results of the investigation.

These figures signify that for the twenty-eight institutions contributing data of this type an average of 245 ratings was retained in the results for ratings by faculty judges, which is equivalent to an average of 8.6 ratings assigned to each student retained as a subject, or an average of 2.9 ratings in each of the three traits rated; whereas for the eight institutions contributing data of this type an average of 1,866 ratings was retained in the results for ratings by student judges, which is equivalent to an average of 68.5 ratings assigned to each student retained as a subject, or an average of 7.6 ratings in each of the nine traits rated.

More significant than these complete returns, however, are the returns for the institutions selected from the total number of cooperating institutions for representation in the conclusions of the investigation because of the relatively satisfactory quality of the data submitted.<sup>2</sup> The returns for these selected institutions consisted of 6,808 ratings received from sixteen institutions submitted by 78 faculty judges for 747 students, and 15,232 ratings received from five institutions submitted by 99 student judges for 180 students. Of these returns, 5,769 ratings submitted by 68 faculty

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analyses of the quantitative and the qualitative information regarding the data presented in Tables XI and XII. The figures involved can be identified by reference to the headings used in the tables, which correspond to the phrases used in the discussion. It should be noted, however, that the figures for both selected and non-selected institutions as given in the tables were combined to arrive at the figures for all cooperating institutions; and that the figures for the twenty-eight cooperating institutions are inclusive of the data retained in the supplementary coefficients of correlation calculated for selected institutions as well as in the principal correlational results obtained for these institutions, whereas in the case of ratings by faculty judges certain series of figures for the sixteen selected institutions derived from information given in Table XI are exclusive of the data retained only in the supplementary coefficients, since these results did not serve as the basis of the conclusions of the investigation. This point will be clarified by reference to Chapter XVII, which contains an account of the statistical treatment of the data.

<sup>2</sup> An explanation of the evaluation of the data, which specifies the criteria used in selecting these institutions, will be given in Chapter XVIII.

judges for 595 students and 14,426 ratings submitted by 86 student judges for 176 students served as the basis of the conclusions of the investigation.

These figures signify that for the sixteen selected institutions represented by this type of judge an average of 361 ratings by faculty judges was retained in the results upon which the conclusions were based, which is equivalent to an average of 9.7 ratings assigned to each student retained as a subject, or an average of 3.2 ratings in each of the three traits rated; whereas for the five selected institutions represented by this type of judge an average of 2,885 ratings by student judges was retained in the results upon which the conclusions were based, which is equivalent to an average of 82.0 ratings assigned to each student retained as a subject, or an average of 9.1 ratings in each of the nine traits rated.

Lastly, total figures for all classifications of the judges in the case of all cooperating institutions show twenty-eight institutions represented by 110 faculty judges rating an average of 25 students in three traits, and eight institutions represented by 106 student judges rating an average of 17 students in nine traits, and in the case of the selected institutions sixteen institutions represented by 78 faculty judges rating an average of 29 students in three traits, and five institutions represented by 99 student judges rating an average of 17 students in nine traits.<sup>3</sup>

From these facts it is apparent that a large measure of co-operation on the part of both faculty and student judges was accorded, particularly in the case of the institutions selected for representation in the conclusions of the investigation, and that the ratings assigned by student judges tended to be much more adequate numerically for the students retained as subjects than the ratings assigned by faculty judges, in spite of the fact that students were requested to rate in three times as many traits as were members of the faculty.

<sup>3</sup> Even so, it is of interest to note that in the case of all cooperating institutions the average faculty judge assigned only 74.0 ratings as compared with 153.8 ratings assigned by the average student judge, and that in the case of the selected institutions the average faculty judge assigned only 87.3 ratings as compared with 153.9 ratings assigned by the average student judge. Thus the average student judge assigned approximately twice as many ratings as the average faculty judge. This is probably due mainly, however, to the fact that in a number of the institutions the rating was assigned to the students as a part of their class work.

## SECTION 2

A CONCRETE DESCRIPTION OF THE TYPICAL INSTITUTIONS  
CONTRIBUTING TO THE CONCLUSIONS OF THE STUDY<sup>4</sup>

It is recognized that so-called typical institutions conjured up from tabulations and measures of central tendency are only abstractions. Nevertheless, it may be of interest to anticipate the information presented in the succeeding chapters by a concrete description of the typical institutions contributing to the conclusions of the present study.<sup>5</sup>

The typical institution represented by faculty judges was a coeducational liberal arts college located in one of the north central states, denominational in affiliation or control, and numbering forty-seven students in the senior class. In order to provide data for the present study, students in this group known to the individual judges were ranked in order by five members of the faculty, who assigned a total of 426 ratings in the three traits *Morality in the Broadest Sense*, *Intellect as Shown in Studies*, and *Intellect as Shown in Activities Other than Studies*. The data obtained were sufficiently adequate to permit the retention of thirty-seven students rated by four judges and receiving an average of three ratings in each of the three traits as the subjects in the correlational results for faculty judges computed for this institution and utilized in the conclusions of the investigation.

The typical institution represented by student judges was also a coeducational liberal arts college located in one of the north central states, likewise denominational in affiliation or control, but numbering thirty-six students in the senior class. In order

<sup>4</sup>This description is based upon the returns for the sixteen institutions characterized by relatively adequate data, and hence selected from the total number of cooperating institutions for representation in the conclusions of the investigation. The method of selection is indicated in detail in the explanation of the evaluation of the data given in Chapter XVIII.

It should be noted that while the sixteen selected institutions were all represented by faculty judges, only five of these institutions were represented by student judges.

<sup>5</sup>The descriptive material utilized in this discussion is based on an analytical study of the cooperating institutions and of the persons who served as subjects or judges, presented in Chapter XV, supplemented as needed by reference to the information given in Chapter XI and Appendix II, Section 1; while the numerical facts utilized are the simple means of the appropriate total figures for selected institutions derived from Table XI, or figures computed on the basis of these means.

to provide data for the present study, students in this group known to the individual judges were ranked in order by twenty of their fellow classmen, who assigned a total of 3,046 ratings in the nine traits *Unselfishness, Loyalty to School and Friends, Justice to All, Courage in Support of Convictions, Self-Control, Activity for Social Welfare, Reliability, Intellect as Shown in Studies, and Intellect as Shown in Activities Other than Studies*. The data obtained were sufficiently adequate to permit the retention of thirty-five students rated by seventeen judges and receiving an average of nine ratings in each of the nine traits as the subjects in the correlational results for student judges computed for this institution and utilized in the conclusions of the investigation.

## CHAPTER XIV

### AN ACCOUNT OF THE PROCURING OF THE DATA

AN ACCOUNT of the procuring of the data given in the two sections of this chapter includes an outline of the methods employed in obtaining the cooperation of the institutions, and a description of the procedures utilized in securing the aid of the judges.

#### SECTION I

##### AN OUTLINE OF THE METHODS EMPLOYED IN OBTAINING THE COOPERATION OF THE INSTITUTIONS

The methods employed in obtaining the cooperation of the institutions were three in number. They may be outlined as follows:

In the first place, a letter was addressed to certain individuals personally or professionally known to the author, requesting their assistance in procuring data, and enclosing rating blanks for faculty and student judges. These requests were sent the latter part of the school year of 1916-17, about the time the United States decided to enter the war, and only two of the nine institutions thus solicited contributed data at this time.<sup>1</sup> In the following school year this method<sup>2</sup> was used in the case of two other institutions, but no additional returns were received.

In the second place, a personal visit was made<sup>3</sup> to six institutions which chanced to be conveniently situated for the purpose, including one of those previously solicited by letter, to request their cooperation in the investigation. The visits in question were made during

<sup>1</sup> In response to the second method of solicitation an additional one of these institutions later contributed data.

<sup>2</sup> The letter sent in these two instances was the routine letter addressed to presidents of institutions to be shortly described. It was accompanied by a personal note in one instance at least, the acquaintance addressed in this case not being the president of the institution in question.

<sup>3</sup> By the author, or, in one instance, by Miss Laura M. Chassell.



the summer and autumn of 1917, and in due time five of the six institutions thus solicited contributed data.

As a result of these two methods the cooperation of seven institutions located in Iowa, Missouri, Ohio, and the District of Columbia was obtained.

Prior to the application of the third method a systematic selection of institutions was undertaken in order to insure a representative sampling. The considerations taken into account in this selection were as follows: (1) geographical location, (2) affiliation or control, and (3) type of institution. In this manner a list of thirty additional institutions was determined upon.

In the third place, then, a routine letter was addressed to the president of each of these thirty institutions, expressing a desire to include the institution in question in the investigation, and requesting the president to name six instructors in the institution who would be best able to rank the members of the senior class in the desired traits, and to specify a professor in the institution who conducted a required course for seniors, or who offered a course elected by a large number of the seniors. In this letter was enclosed a copy of the rating blank for faculty judges, and a letter authorizing the investigation which bore the signature of the Dean of Teachers College, Columbia University. These letters were sent out in the fall of 1917, and eventually twenty-one of the thirty institutions thus solicited contributed data.

As a result of these three methods, the total number of institutions cooperating in the investigation was brought to twenty-eight. The institutions contributing data thus constituted three-fifths of the forty-six institutions solicited by all methods.<sup>4</sup> The expected date of graduation of the seniors for whom data were

<sup>4</sup>The reasons for failure to contribute data in the case of the eighteen institutions solicited which did not cooperate in the investigation follow:

Reasons for Failure	No. of Institutions Represented
No reply was received to the initial letter requesting assistance, and a second request was not made .....	12
The request was addressed to a former president, and a second letter was not sent to his successor .....	2
The organization of the institution solicited appeared to be ill adapted to the method of investigation determined upon .....	1
The time the request was received proved to be unfavorable for undertaking the rating .....	1
The prospective faculty judges considered the requested rating too difficult, although the president of the institution had sanctioned the investigation .....	2

requested was 1917 in the case of the two institutions first contributing data, and 1918 in the remaining instances.

The names of the twenty-eight institutions, arranged alphabetically by states, are given below:

Arkansas	University of Arkansas
California	Pomona College
Connecticut	Wesleyan University
District of Columbia	George Washington University
District of Columbia	Howard University
Georgia	Atlanta University
Georgia	Georgia School of Technology
Idaho	University of Idaho
Iowa	Cornell College
Iowa	Des Moines College
Iowa	Simpson College
Kansas	Washburn College
Kentucky	Transylvania College
Maine	Bates College
Mississippi	University of Mississippi
Missouri	William Woods College
Montana	State College of Agriculture and Mechanic Arts
Nebraska	Creighton University
Nevada	University of Nevada
Ohio	Heidelberg University
Ohio	Municipal University of Akron
Pennsylvania	Lincoln University
Pennsylvania	Swarthmore College
South Dakota	University of South Dakota
Tennessee	Maryville College
Texas	Baylor University
Utah	University of Utah
Washington	Whitman College

These institutions are designated by key numbers in the presentation of results throughout the investigation.<sup>5</sup>

## SECTION 2

### A DESCRIPTION OF THE PROCEDURES UTILIZED IN SECURING THE AID OF THE JUDGES

The procedures utilized in securing the aid of the judges varied somewhat according to the method employed in obtaining the co-

<sup>5</sup> A key to the institutions cooperating in the investigation of the relation between moral and intellectual traits will be found in Appendix II, Section 1.

operation of the institution in question. The procedures utilized in each instance are indicated below:

In the case of the two institutions replying favorably to the letter addressed to an individual personally or professionally known to the author, the necessary details in obtaining the ratings from both faculty and student judges were attended to by the person addressed.

In the case of the institutions personally visited, the faculty rating blanks, accompanied by a letter of explanation, were sent by the author either individually to the members of the faculty selected to serve as judges, or collectively to one member who had been selected to procure the data for the institution in question, unless arrangements had been completed on the occasion of the visit. Likewise the rating blanks for student judges were sent to the member of the faculty selected to obtain these ratings. On both types of rating blanks the names of the members of the senior class, previously procured from the institution in question, had been entered before they were placed in the hands of the judges. Further, since early experience had revealed the necessity for additional information regarding the method of rating, a sample rating sheet, on which the names of fictitious persons to whom ratings had been assigned were supplied, was enclosed with the later rating blanks for faculty judges.

In the case of the institutions replying favorably to the letter addressed to the president, the faculty rating blanks, accompanied by a letter explaining the circumstances attending the selection of the judges in question with detailed instructions for rating, and enclosing the sample rating sheet, and in a number of cases also the letter authorizing the investigation, were sent directly to the prospective judges. About the same time the rating blanks for student judges were sent to some member of the staff,<sup>6</sup> customarily the instructor named by the president as one who conducted a required course for seniors.<sup>7</sup> On both types of rating blanks the list of senior names was entered as in the preceding case.

Subsequently a follow-up letter enclosing a second rating blank was sent in most instances to the prospective faculty judges who failed to respond to the first request, and, also, if necessary, to the person selected to procure all the data for a given institution, or

<sup>6</sup> Ratings by student judges were not requested in the case of Institutions 2, 5, 7, 14, and 26, all of which were characterized by unusually large senior classes, in view of the fact that a fairly adequate supply of ratings by student judges had already been received from other institutions.

<sup>7</sup> The only important variation from the typical procedure described above was in the case of Institution 23, in which instance the rating blanks for student judges, accompanied by two circular letters, one signed by the secretary to the president of the institution in question and the other signed by the author, were sent directly to the individual members of the senior class. This procedure proved to be comparatively ineffectual.

in a number of instances to the person selected to procure the ratings by student judges. By this means ratings by four faculty judges, representing as many different institutions, and an entire set of ratings for another institution, including ratings by five faculty judges and by sixteen student judges, appear to have been added.<sup>8</sup>

As a result of these procedures all but twenty-seven of the prospective faculty judges in the twenty-eight institutions co-operating in the investigation responded to the request for data, and of those responding, all but thirty-one submitted ratings;<sup>9</sup> moreover, all but nine of the twenty-three institutions from which ratings by student judges were requested responded to the request for data, but of those responding only eight submitted ratings.

<sup>8</sup> This statement is based on the available data. However, a complete record of follow-up letters was not kept. No follow-up letters were sent in the case of the first method of solicitation employed, nor were such letters sent directly to prospective student judges, with the possible exception of cases in which data already promised had not been received.

<sup>9</sup> These figures do not cover possible instances of failure to respond or to submit ratings on the part of prospective judges in the institutions in which the data were collected by some member of the faculty of the institution in question rather than by means of personal letters addressed to the individual judges.

## CHAPTER XV

### AN ANALYTICAL STUDY OF THE COOPERATING INSTITUTIONS AND OF THE PERSONS WHO SERVED AS SUBJECTS OR JUDGES

AN ANALYTICAL study of the cooperating institutions and of the persons who served as subjects or judges reported in the three sections of this chapter includes an analysis of geographical location, affiliation or control, and type of institution, a description of the subjects, and a description of the judges.

#### SECTION I

##### AN ANALYSIS OF GEOGRAPHICAL LOCATION, AFFILIATION OR CONTROL, AND TYPE OF INSTITUTION<sup>1</sup>

The present analysis considers the facts regarding geographical location, affiliation or control, and type of institution not only for the twenty-eight institutions cooperating in the investigation taken as a whole, but also for the sixteen institutions selected from this larger number for representation in the conclusions of the investigation because of the relatively satisfactory quality of the data contributed.<sup>2</sup> The three aspects of the analysis correspond to the three considerations which were taken into account in the systematic selection of institutions for the purpose of insuring a representative sampling in the investigation.<sup>3</sup>

An analysis of geographical location discloses that the twenty-

<sup>1</sup>The detailed information upon which this discussion is based may be found in the key to the institutions cooperating in the investigation given in Appendix II, Section I. The information in question can be readily identified by reference to the headings used in the key, since three of these headings correspond to the three divisions of the discussion.

<sup>2</sup>An explanation of the evaluation of the data will be given in Chapter XVIII.

<sup>3</sup>The systematic selection of institutions is described in the first section of the preceding chapter.

eight cooperating institutions represent twenty-one states and the District of Columbia, whereas the sixteen selected institutions represent thirteen states. An assignment of these states to the proper geographical divisions<sup>4</sup> reveals that each of the nine geographical divisions claims two or more institutions among the twenty-eight cooperating institutions, and that eight of these divisions claim at least one institution among the sixteen selected institutions. The distribution of these institutions according to geographical division is as follows:

Geographical Division	No. of Institutions Represented	
	<i>Cooperating Institutions</i>	<i>Selected Institutions</i>
New England .....	2	1
Middle Atlantic .....	2	2
East North Central .....	2	2
West North Central .....	7	4
South Atlantic .....	4	0
East South Central .....	3	2
West South Central .....	2	2
Mountain .....	4	1
Pacific .....	2	2

An analysis of affiliation or control discloses that exactly half of the twenty-eight cooperating institutions, including ten of the sixteen selected institutions, may be styled denominational<sup>5</sup> in contrast to the remaining institutions, which are non-sectarian, municipal, or state. The twenty-eight cooperating institutions represent nine denominations, including both Protestant and Catholic, whereas the sixteen selected institutions represent but seven, all Protestant. The detailed analysis of the affiliation or control of these institutions is given on the following page.

An analysis of type of institution discloses that the twenty-eight cooperating institutions are predominantly coeducational, as witnessed by the fact that they include twenty-four institutions of this type in contrast to three men's colleges and one girls' boarding school, and that the sixteen selected institutions are coeducational

<sup>4</sup> Following the terminology and the method of classification used in the reports published by the United States Bureau of the Census (cf. 201, p. 7).

<sup>5</sup> The use of the term *denominational* in this connection does not necessarily imply control.

It will be observed that in order to simplify the discussion the term is applied to both Protestant and Catholic institutions.

Affiliation or Control	No. of Institutions Represented	
	<i>Cooperating Institutions</i>	<i>Selected Institutions</i>
Baptist .....	2	1
Christian .....	1	1
Congregational .....	2	2
Disciples of Christ .....	1	0
Friends .....	1	1
Methodist Episcopal .....	3	2
Presbyterian .....	2	2
Reformed .....	1	1
Roman Catholic .....	1	0
Non-Sectarian .....	5	2
Municipal .....	1	1
State .....	8	3

except for one men's college and one girls' boarding school. Information as to race is supplied for the twenty-eight cooperating institutions only in the case of the three institutions for Negro students, and for the sixteen selected institutions only in the case of the one institution of this type included. In the remaining institutions it may be assumed that, barring an occasional exception, the students were members of the white race.

In conclusion, it may be noted that all of the twenty-eight cooperating institutions, and thus all of the sixteen selected institutions, were represented by faculty judges, and that eight of the cooperating institutions, including five classed among the selected institutions for this type of judge, were also represented by student judges.

## SECTION 2

### A DESCRIPTION OF THE SUBJECTS

A consideration of the colleges or the courses of study represented by the group of seniors for whom ratings were requested<sup>6</sup> discloses that, whether the twenty-eight cooperating institutions or the sixteen selected institutions are under consideration, the students to be rated were predominantly members of the senior class in colleges of liberal arts. Thus twenty-four of the twenty-eight

<sup>6</sup>As given in the key to the institutions cooperating in the investigation, which will be found in Appendix II, Section 1.

cooperating institutions, including fifteen of the sixteen selected institutions, were four-year colleges of liberal arts or universities represented in the research by colleges of this type, and an additional institution, included not only among the cooperating institutions but also among the selected institutions, was a junior college also of the liberal arts type.<sup>7</sup> In the case of three universities included among these twenty-five institutions, however, the group of seniors for whom ratings were requested was not confined to liberal arts seniors, but represented all the colleges in the institution in question,<sup>8</sup> one of the three universities referred to being classed among the selected institutions.<sup>9</sup> The remaining three institutions included among the twenty-eight cooperating institutions, but not among the sixteen selected institutions, were professional schools,

<sup>7</sup> The term *liberal arts* is here used in a general sense to cover the various designations employed in a written communication or a catalogue received from the institution in question, or the designation thought most appropriate after a study of the courses offered by the institution and a consideration of the degrees conferred thereby. The following list gives the more precise terms with their frequencies:

Designation	No. of Institutions Represented	
	<i>Cooperating Institutions</i>	<i>Selected Institutions</i>
College .....	2	2
College of Liberal Arts .....	5	4
College of Arts .....	1	0
College of Arts and Science .....	1	1
College of Arts and Sciences .....	3	1
College of Letters and Science .....	1	0
School of Arts and Sciences .....	1	0
College course .....	1	0
Liberal Arts course .....	3	3
Courses in Arts and Science .....	3	1
Courses in Arts and Applied Science	1	1
Courses in Arts and Sciences, Ex- pression, and Music .....	1	1
Courses in Arts, Science, and Music	1	1
Literary Department .....	1	1

<sup>8</sup> The various types of colleges represented in the case of the three universities in question were as follows:

(1) Colleges of Agriculture, Arts and Sciences, Education, and Engineering.

(2) Colleges of Agriculture, Engineering, Law, and Letters and Science.

(3) Colleges of Arts, Dentistry, Law, Medicine, and Pharmacy.

<sup>9</sup> The university in question is the first of the three for which information concerning types of colleges is supplied in the preceding footnote.



as follows: a teachers college, a school of technology, and a college of agriculture and mechanic arts.

Although omissions in the ratings submitted by faculty and student judges led to the elimination of certain of the students for whom ratings were requested, and likewise to the elimination of certain of the students for whom ratings were submitted,<sup>10</sup> the effect of this elimination was slightly to increase the relative proportion of seniors in colleges of liberal arts.<sup>11</sup>

In view of the considerations discussed, the students retained as subjects in the investigation may be described as seniors who, with very few exceptions, were enrolled in colleges of liberal arts.

### SECTION 3

#### A DESCRIPTION OF THE JUDGES

A consideration of the available information regarding the type of judges represented in the investigation<sup>12</sup> discloses that, whether the twenty-eight cooperating institutions or the sixteen selected institutions are being considered, the faculty judges were members of the faculty<sup>13</sup> who were principally of professorial rank,<sup>14</sup> whereas the student judges were principally seniors, but included in their number students who were associated with seniors in class.<sup>15</sup>

<sup>10</sup> The elimination of any data which failed to meet certain minimum requirements is described in an outline of the treatment of faulty data, given in Chapter XVII.

It should be particularly noted that in the case of the three universities described in a preceding footnote, seniors in each of the colleges represented were not necessarily included among the students retained as subjects in the investigation, since in certain instances all the seniors in a given college had to be eliminated as a result of the method followed in the treatment of faulty data, referred to above.

<sup>11</sup> Proof of this statement will be found in the key to the institutions cooperating in the investigation given in Appendix II, Section I.

<sup>12</sup> As contained in the letters and the catalogues received from the various institutions, or found on the rating blanks.

<sup>13</sup> Either at the time the ratings were submitted or shortly before that time.

<sup>14</sup> The faculty judges for the twenty-eight cooperating institutions, and likewise for the sixteen selected institutions, included deans, heads of departments, professors, and instructors, a college president also being included in the case of one of the cooperating institutions which was not classed among the selected institutions.

<sup>15</sup> Detailed information as to the classification of the student judges is

It is therefore evident that both faculty and student judges, taken as groups, were of a high type intellectually. It may doubtless be assumed that in general they were also of a high type morally.

given below for the eight institutions represented by this type of judge, the information for the five selected institutions included being in italics:

Key No. of Institution	No. of Student Judges	Classification of Student Judges
6	1	Member of senior class
9	39	<i>Members of senior class in psychology</i>
4	1	Uncertain: probably member of senior class
16	16	<i>Members of senior class in junior college</i>
21	16	<i>Members of class in psychology which included some of seniors</i>
22	9	<i>Uncertain: probably members of senior class</i>
23	5	Members of senior class
28	19	<i>Members of senior class</i>

## CHAPTER XVI

### AN ANALYTICAL STUDY OF THE RETURNS

AN ANALYTICAL study of the returns reported in the two sections of this chapter includes a quantitative and a qualitative study of the returns.

#### SECTION I

##### A QUANTITATIVE STUDY OF THE RETURNS

The quantitative study of the returns reported in this section may be distinguished from the qualitative study of the returns reported in the succeeding section by its emphasis on the numerical aspects of the ratings, as disclosed by an analysis of the quantitative information regarding the data.

##### *An Analysis of the Quantitative Information regarding the Data*

Table XI presents an analysis of the quantitative information regarding the data.

As the two principal divisions of the table indicate, this information is given first for selected institutions, separately for ratings by faculty and student judges, and secondly for non-selected institutions,<sup>1</sup> again separately for the two types of ratings.

The table gives the key number of the institution for the twenty-eight institutions represented by faculty judges and the eight institutions represented by student judges, allocated as appropriate to the several divisions of the table, the final grade assigned to the

<sup>1</sup> As the explanation of the evaluation of the data given in Chapter XVIII makes clear, the terms *selected institutions* and *non-selected institutions* refer, respectively, to the institutions contributing data which were sufficiently adequate to serve as the basis for the conclusions of the investigation, and the institutions contributing data which were not sufficiently adequate for this purpose, the routine correlational results for the selected institutions accordingly being presented in Part II and all results for the non-selected institutions in Appendix II.

TABLE XI  
AN ANALYSIS OF THE QUANTITATIVE INFORMATION  
REGARDING THE DATA

KEY NO. OF INSTI- TUTION <sup>a</sup>	FINAL GRADE ASSIGNED TO RATINGS <sup>b</sup>	COMPOSITE SCORE USED IN DETER- MINING ORDER OF INSTITU- TIONS <sup>c</sup>	DETAILED INFORMATION REGARDING STUDENTS, JUDGES, AND RATINGS					
			NO. OF STUDENTS FOR WHOM RATINGS WERE REQUESTED	NO. OF STUDENTS RETAINED AS SUBJECTS <sup>d</sup>	NO. OF JUDGES SUBMITTING RATINGS	NO. OF JUDGES RETAINED IN RESULTS <sup>e</sup>	NO. OF RATINGS SUBMITTED	NO. OF RATINGS RETAINED IN RESULTS <sup>e</sup>
SELECTED INSTITUTIONS								
Ratings by Faculty Judges								
20	A	72	40	40	6	6	656	641
12	A	72	37	37	5	5	435	435
22	B	71	32	32	6	6	455	455
25	B	70	25	25	5	5	361	361
*14	B	68	93	93	4	4	941	921
1	B	59	45	40	5	5	372	357
28	C	61	26	26	5	5	336	336
11	C	60	49	44+0	7	5+1	462	396+33
* 2	C	58	68	43	2	2	348 <sup>f</sup>	258
16	C	58	17	17	6	5	262	238
21	C	55	24	24	5	4	281	254
*23	C	50	86	46+2	5	4+1	410	301+30
*26	D	42	64	54	5	3	600	354
* 9	D	37	81*	45	4	3	527 <sup>h</sup>	257
19	D	31	26	17+6	5	4+1	217	133+39
15	D	29	34	12	3	2	145	72
Ratings by Student Judges								
* 9	A	74	81	77	39	37	6185	6009
21	C	56	24	24	16	16	2827	2733
16	C	51	17	17	16	16	2343	2343
28	C	48	26	26	19	8	1693 <sup>i</sup>	1213
22	C	45	32	32	9	9	2184 <sup>j</sup>	2128
NON-SELECTED INSTITUTIONS								
Ratings by Faculty Judges								
6	E	52	11	8	6	6	131	106
10	E	32	22 <sup>k</sup>	21	5	5	263 <sup>l</sup>	241
24	E	18	22	9	4	3	137	70
8	E	10	44	15	2	2	149	75
*18	E	8	95	19+8 <sup>m</sup>	3	2+1	129	95+24
* 7	E	13	89	26+4	3	2+1	222	104+30
17	E	21	39	32	3	1	129	96
4	E	13	15	15	1	1	45	45
* 3	E	5	61	15	1	1	45	45
13	E	2	13	7	1	1	21	21
5	E	0	48	10	2	1	45	30
27	E	2	23	9	1	1	19	18
Ratings by Student Judges								
*23	E	5	86	20	5	3	873	319
4	E	4	15	11	1	1	99	99
6	E	8	11	11	1	1	99	88

<sup>a</sup> Key numbers preceded by an asterisk indicate institutions numbering more than 50 students in the group of seniors for whom ratings were requested. This fact had some significance for procedure, as explained in the second section of the succeeding chapter.

<sup>b</sup> The final grades assigned to the ratings were determined in the course of the evaluation of the data on the basis of a number of criteria. A general account of the criteria employed in the evaluation of the data will be found in Chapter XVIII.

ratings by faculty and by student judges, the composite score used in determining the order of institutions in the principal tables, and detailed information regarding the students, the judges, and the ratings for each institution, including the number of students for whom ratings were requested on the rating blanks sent to the prospective judges, the number of students retained as subjects in the investigation, the number of judges submitting ratings in the various traits, the number of judges retained in the results of the investigation, the number of ratings submitted in the various traits, and the number of ratings retained in the results of the investigation.<sup>2</sup>

The analysis of the quantitative information regarding the data presented in Table XI may be interpreted as follows:<sup>3</sup>

<sup>2</sup> An outline of the treatment of faulty data, which includes an account of the elimination of any data which failed to meet certain minimum requirements, will be found in the succeeding chapter.

<sup>3</sup> It should be explained that the average percentages of retained data for students, judges, and ratings as given in this discussion in the case of all cooperating institutions include all the data retained in any of the correlational results as presented either in Part II or in Appendix II, and in the case of the selected institutions all the data retained in the routine correlational results as presented in Part II, the data represented only in the supplementary coefficients calculated for a number of institutions in the case of ratings by faculty judges and reported in Appendix II being omitted in the latter case. This statement will be clarified by reference to the account of the statistical treatment of the data given in the succeeding chapter.

<sup>c</sup> The composite scores used in determining the order of institutions were calculated in the course of the evaluation of the data from the grades assigned on the basis of the criteria referred to in the preceding footnote. The method of calculating these composite scores is described in the first section of Chapter XVIII.

It should be noted that not only the composite score, but also the final grade assigned to the ratings and the type and number of coefficients calculable, were taken into consideration in determining the order of the institutions.

<sup>d</sup> A second figure in this column has reference only to supplementary coefficients of correlation, that is, the coefficients calculated for individual faculty judges in the case of institutions with 2 or more other retained judges; and merely indicates the number of students included in the supplementary coefficients who were not also included in the principal correlational results. The circumstances under which supplementary coefficients were calculated are explained in the last section of the succeeding chapter.

<sup>e</sup> A second figure in this column has reference only to the supplementary coefficients of correlation, defined in the preceding footnote, and indicates the number of judges or the number of ratings, as the case may be, represented in these results.

<sup>f</sup> The figure given does not include 4 descriptive ratings assigned by 1 judge to students whom he had not otherwise rated in the trait concerned.

<sup>g</sup> The figure given does not include the name of a student omitted in the rating blanks given to student judges, and consequently eliminated with any ratings assigned from the rating blanks submitted by faculty judges. The ratings thus eliminated are accordingly disregarded in the figures for number of ratings given in the table for this institution.

<sup>h</sup> The figure given does not include the irregular ratings assigned by 1 judge from whom a revised series of ratings which had been requested was received.

<sup>i</sup> The figure given does not include 45 descriptive ratings assigned by 1 judge in two traits, 26 of which were assigned to students whom he had also rated numerically in the trait concerned.

<sup>j</sup> The figure given does not include extra ratings apparently inserted by mistake by 3 judges in three, two, and one traits, respectively.

<sup>k</sup> The figure given does not include the name of a student appearing on the rating blank for 1 faculty judge only, and consequently eliminated with any ratings assigned from the rating blank in question. The ratings thus eliminated are accordingly disregarded in the figures for number of ratings given in the table for this institution.

<sup>l</sup> The figure given does not include the irregular ratings assigned by 2 judges from each of whom a revised series of ratings which had been requested was received.

<sup>m</sup> The two groups specified represent seniors in different colleges of the university concerned. The first group was rated by 2 teachers, and the second by 1 teacher, in these colleges.

(1) In comparison with all cooperating institutions, the selected institutions tend to show a much higher percentage of students retained as subjects as contrasted with about the same percentage of judges and of ratings retained in the results, whether ratings by faculty judges or ratings by student judges are considered, as indicated by the facts enumerated below:

(a) In the case of all cooperating institutions, for the twenty-eight institutions represented in the ratings by faculty judges, on the average 65 per cent of the students for whom ratings were requested were retained as subjects, whereas on the average 90 per cent of the judges submitting ratings and 84 per cent of the ratings submitted were retained in the results; similarly, for the eight institutions represented in the ratings by student judges, on the average 75 per cent of the students for whom ratings were requested were retained as subjects, whereas on the average 86 per cent of the judges submitting ratings and 92 per cent of the ratings submitted were retained in the results.<sup>4</sup>

(b) In the case of the selected institutions, for the sixteen institutions represented in the ratings by faculty judges, on the average 80 per cent of the students for whom ratings were requested were retained as subjects, whereas on the average 87 per cent of the judges submitting ratings and 85 per cent of the ratings submitted were retained in the results; on the other hand, for the five institutions represented in the ratings by student judges, on the average 98 per cent of the students for whom ratings were requested were retained as subjects, whereas on the average 87 per cent of the judges submitting ratings and 95 per cent of the ratings submitted were retained in the results.<sup>4</sup>

(2) The selected institutions tend to be characterized by progressively more satisfactory data as those represented by ratings to which the higher final grades were assigned are reached, as indicated by the facts enumerated below:

(a) In the case of ratings by faculty judges, the average percentages of retained students, judges, and ratings are in order 100, 100, and 99 for the two institutions represented by ratings assigned a final grade of A; 97, 100, and 98.5 for the four insti-

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In obtaining the average percentages for all cooperating and for the selected institutions, the total figures derived from Table XI were utilized; while in obtaining the average percentages for the institutions represented by a given final grade, the percentages of retained data for the individual institutions were averaged.

<sup>4</sup> Since it will be observed that the percentage retained in the case of the ratings for faculty judges is lower than in the case of the ratings for student judges in two out of three instances, whether all cooperating institutions or the selected institutions are considered, it should be stated that one of the rules for the elimination of faulty data would operate in favor of the student judges, and that therefore no inference as to the superiority of one type of ratings over the other is possible from the foregoing information.

tutions represented by ratings assigned a final grade of B;<sup>6</sup> 84, 86, and 86 for the six institutions represented by ratings assigned a final grade of C; and 60, 70.5, and 55 for the four institutions represented by ratings assigned a final grade of D.

(b) In the case of ratings by student judges, the percentages of retained students, judges, and ratings are in order 95, 95, and 97 for the one institution represented by ratings assigned a final grade of A;<sup>8</sup> while the corresponding average percentages are in order 100, 85.5, and 91.5 for the four institutions represented by ratings assigned a final grade of C.

(3) The non-selected institutions tend to be characterized by irregular and relatively unsatisfactory data, as indicated by the facts enumerated below:

(a) In the case of ratings by faculty judges, the average percentages of retained students, judges, and ratings are in order 49, 74, and 67 for the eight institutions represented by 2 or more judges submitting ratings, the remaining four institutions being represented by a single judge.

(b) In the case of ratings by student judges, the percentages of retained students, judges, and ratings are in order 23, 60, and 37 for the one institution represented by 5 judges submitting ratings, the remaining two institutions being represented by a single judge.

From these facts it is apparent that the quantitative information regarding the data is a significant indication of the quality of the data, and as such a prophecy of the qualitative information regarding the data to be considered in the succeeding section. It is further apparent that decided quantitative and qualitative differences are to be noted in the data for the individual institutions, and likewise in the data for the selected institutions as contrasted with the non-selected institutions included in the investigation. Lastly, in view of the fact that on the average not less than four-fifths of the data represented in the ratings by both faculty and student judges met the requirements for retention in the case of the selected institutions, it is evident that the conclusions of the investigation are based on adequate and representative returns.

<sup>6</sup> It is of interest to note that one of the four institutions participated in the results with 93 students, which is by far the largest number for any institution represented by either faculty or student judges cooperating in the investigation.

<sup>8</sup> It is of interest to note that this institution participated in the results with 77 students, which is more than double the number for any other institution represented by student judges cooperating in the investigation.

## SECTION 2

## A QUALITATIVE STUDY OF THE RETURNS

The qualitative study of the returns reported in this section may be distinguished from the quantitative study of the returns reported in the preceding section by its emphasis upon the method of rating employed, as disclosed by an analysis of the qualitative information regarding the data.

*An Analysis of the Qualitative Information regarding  
the Data*

Table XII presents an analysis of the qualitative information regarding the data.

As the two principal divisions of the table indicate, this information is given first for selected institutions, separately for ratings by faculty and student judges, and secondly for non-selected institutions,<sup>7</sup> again separately for the two types of ratings.

The table gives the classification of the judges, detailed information regarding the judges, the students, and the ratings for each institution, including the number of judges assigning ratings, the average number of students rated in each trait (numerically only), and the number or the average number of traits rated by the judges (if appropriate), for each classification, and the key-number of the institution for the twenty-eight institutions represented by faculty judges and the eight institutions represented by student judges, allocated as appropriate to the several divisions of the table.

The analysis of the qualitative information regarding the data presented in Table XII may be interpreted as follows:

- (1) A difference in the quality of the data contributed by the selected and the non-selected institutions is suggested at once by the fact that the highest classification of the judges, calling for

<sup>7</sup> As the explanation of the evaluation of the data given in Chapter XVIII makes clear, the terms *selected institutions* and *non-selected institutions* refer, respectively, to the institutions contributing data which were sufficiently adequate to serve as the basis for the conclusions of the investigation, and the institutions contributing data which were not sufficiently adequate for this purpose, the routine correlational results for the selected institutions accordingly being presented in Part II and all results for the non-selected institutions in Appendix II.



the ranking of all students in the maximum number of traits, is represented almost entirely by judges from selected institutions in the case of ratings by faculty judges and wholly by judges from selected institutions in the case of ratings by student judges. Although the tendency to supply all the ratings was thus much more pronounced in the case of the selected institutions than in that of the non-selected institutions, it will be noted that only one judge in the entire number, whether faculty or student, met the requirements of this classification if the total number of students exceeded 40.

(2) For all cooperating as well as for the selected institutions, the second and the third classifications are represented by the largest number of judges and also by the largest number of institutions, whether ratings by faculty judges or ratings by student judges are taken into consideration, the only other classifications represented to any extent by both types of ratings being the first and the fourth, the eighth also being important for the first type. Thus the predominant types of judges are faculty judges ranking all or selected students in three traits, and student judges ranking all or selected students in nine traits, judging an equal or an unequal number in the traits. It is interesting to note, however, that either two or three classifications are usually represented by the faculty judges and not less than four classifications by the student judges for any one institution, the number of traits rated being customarily the maximum in either case.

(3) In the case of both selected and non-selected institutions, all or practically all the judges, whether faculty or student, assigned ratings in rank order. However, in the case of the selected institutions 83 per cent of the faculty judges ranked students in three traits and 78 per cent of the student judges ranked students in nine traits, whereas in the case of the non-selected institutions only 69 per cent of the faculty judges and 71 per cent of the student judges cooperated to this extent.

(4) For ratings by both types of judges, the average number of students rated for all the institutions represented by a particular classification is comparatively high for the first and the third classifications, being 31 for both classifications in the case of ratings by faculty judges, and 24 for the former and 20 for the latter in the case of ratings by student judges, as compared with averages of 22 and 11, respectively, for the second and the fourth classifications in the case of ratings by faculty judges, and averages of 16 and 15, respectively, for these classifications in the case of ratings by student judges. At the same time, the corresponding averages for the three less representative classifications which are descriptive of the ratings of more than one judge, all of which chance to be for faculty judges, are in order 27, 24, and 28.



	Ratings by Student Judges				Ratings by Student Judges			
	9	21	16	28	22	23	4	6
I. Judges Ranking All Students in Nine Traits								
No. of Judges		1	6		1			
Av. No. of Students Rated		24	17		32			
II. Judges Ranking Selected Students in Nine Traits, Judging Equal Number in Traits								
No. of Judges	22	2	6	3	2		1	
Av. No. of Students Rated	15	22	16	3	30		11	
III. Judges Ranking All or Selected Students in Nine Traits, Judging Unequal Number in Traits								
No. of Judges	7	10	4	9	4	4		
Av. No. of Students Rated	21	19	16	14	25	24		
IV. Judges Ranking All or Selected Students in Fewer Than Nine Traits, Judging Equal or Unequal Number in Traits								
No. of Judges	6	3		6	2	1		
Av. No. of Students Rated	19	18		8	26	3		
Av. No. of Traits Rated	7	8		7	8	4		
V. Judges Ranking Selected Students or Rating Them Descriptively <sup>a</sup> in Fewer Than Nine Traits, Judging Unequal Number in Traits								
No. of Judges				1				
Av. No. of Students Rated				10				
Numerically <sup>b</sup>				5				
No. of Traits Rated								
VI. Judges Ranking All Students in Eight Traits and Rating Them Irregularly in One Trait, Judging Equal Number in Traits								
No. of Judges								1
Av. No. of Students Rated								11
VII. Judges Rating Selected Students Irregularly in Nine Traits, Judging Equal or Unequal Number in Traits								
No. of Judges	4							
Av. No. of Students Rated	23							

<sup>a</sup> This figure is calculated on the basis of three traits, as in the case of the other classifications for ratings by faculty judges.

<sup>b</sup> The entries opposite this classification disregard irregular ratings in three traits submitted by 1 judge in the case of Institution 9 and 2 judges in the case of Institution 10, since these judges submitted revised ratings after being requested to do so.

<sup>c</sup> This figure is calculated on the basis of nine traits, as in the case of the other classifications for ratings by student judges.

<sup>d</sup> Or both ranking and rating them descriptively.

(5) The outstanding example of faculty judge cooperation is presented by Institution 14,<sup>8</sup> and the outstanding example of student judge cooperation by Institution 9.<sup>9</sup>

From these facts it is apparent that, although the data submitted were on the whole satisfactory in quality, qualitative differences in the data for the individual institutions were marked and important. It is further apparent that the quality of the data contributed by the selected institutions tends to be superior to the quality of the data contributed by the non-selected institutions, whether ratings by faculty judges or ratings by student judges are taken into consideration.

<sup>8</sup> In this institution one faculty judge rated all of the 93 students for whom ratings were requested in all three traits, and a second faculty judge rated an average of 90 students in all three traits. These judges submitted the largest number of ratings of any faculty judges, regardless of institution.

<sup>9</sup> In this institution one student judge rated 45 students in eight traits and 44 in the ninth. This number of ratings was exceeded by only one other judge, namely, a student judge in Institution 23, who rated an average of 50 students in the nine traits.

## CHAPTER XVII

### AN ACCOUNT OF THE STATISTICAL TREATMENT OF THE DATA

**A**N ACCOUNT of the statistical treatment of the data given in the three sections of this chapter includes a description of the method of recording the data, an outline of the treatment of faulty data, and an explanation of the procedures required in the correlational analysis of the data.

#### SECTION I

##### A DESCRIPTION OF THE METHOD OF RECORDING THE DATA

After the returns from a given institution had been received, the first problem was the recording of the data in a manner that would provide for the determination of the reliability of the ratings and for the correction of chance errors. Accordingly, as far as possible the ratings were divided into two approximately equivalent measures of each trait. In the case of ratings by both faculty and student judges, therefore, if ratings had been submitted by an even number of judges, the ratings of one-half of the judges were tabulated opposite the key numbers of the students for whom ratings had been requested as one measure of the trait in question, and the ratings of the remaining judges were tabulated to the right of these as the second measure; if ratings had been submitted by an uneven number of judges, however, an extra series of ratings was necessarily assigned to one or the other half of the data.

Although the assignment of the ratings submitted by the different judges to one or the other halves of the data was generally random, considerable attention was paid to the number of students rated by each judge, particularly if ratings had been received from an uneven number of judges, in order to insure wherever pos-

sible that approximately the same number of ratings were represented by each half of the data. Special precautions were also taken if the data were unusually fragmentary or unsatisfactory in some other respect.

Should subsequent eliminations in the ratings require an adjustment in the assignment of any series of ratings to a given half of the data, the necessary adjustment to retain a balanced assignment of the ratings to the two halves of the data was made.

## SECTION 2

### AN OUTLINE OF THE TREATMENT OF FAULTY DATA

The analytical study of the returns presented in the preceding chapter clearly showed the quantitative and the qualitative differences in the data contributed by the different institutions cooperating in the investigation. In these differences lies the need for the more or less involved methods devised for the treatment of faulty data.

It will be recalled that the instructions to the faculty judges, as reproduced in Chapter XI, provided for omissions in the rankings of any students whom the judges did not feel they knew sufficiently well to grade fairly. Although no such provision for omissions in the rankings was contained in the instructions to student judges, for both types of judges omissions in the data were the rule rather than the exception. As a result, the central problem in the treatment of faulty data was to adjust the ratings in such a way that the several series of ratings submitted by faculty judges or by student judges in the case of a given institution would be roughly comparable to one another, and hence could be combined into the two measures required for each trait.

Before the present investigation was undertaken, an elaborate technique of combining incomplete judgments of relative position had been devised by Thorndike (195). Although this procedure could have been utilized in this investigation in the instances in which a sufficiently large number of ratings had been received, it was not generally applicable, and proved to be more intricate and time-consuming than necessary in view of the large number of cooperating institutions and the fairly satisfactory character of

much of the data contributed. Hence a practicable procedure for treating omissions in the data was determined upon.<sup>1</sup> This procedure consisted in the selection of the more adequate data for utilization in the routine statistical processes, and the rough equating of the retained data for faculty or student judges in the case of each institution.

In these circumstances the first step in the treatment of faulty data was the elimination of any data which failed to meet certain minimum requirements.<sup>2</sup>

Thus, after the tabulation of the data for a given institution received from faculty or student judges had been completed, the ratings assigned were examined, and all students not rated numerically by at least two judges in all traits were excluded as subjects, with this exception, however, that for institutions numbering more than fifty students in the senior class<sup>3</sup> students so rated by at least two judges in two-thirds of the traits<sup>4</sup> were retained as subjects.<sup>5</sup> Following this elimination of students, judges themselves were eliminated in the case of any trait in which they had not rated at least one-half of the number of students retained as subjects (or some other figure taken as the norm<sup>6</sup>) in the case of ratings

<sup>1</sup> It is interesting to note that more recently Garrett, by means of an empirical study of the various methods of combining incomplete order of merit ratings (143), has shown that it is unnecessary to make use of the more refined procedures. In fact, he found the simplest possible method, that of averaging the incomplete rankings, highly satisfactory.

<sup>2</sup> Aside from the fact that irregularities occurring in two instances in the case of institutions represented by a single judge were handled in accordance with the procedure described, this procedure was applied only to institutions represented by two or more judges, since the single judges referred to consistently rated the same students in the traits in which they rated.

<sup>3</sup> That is, in the group of seniors for whom ratings were requested.

<sup>4</sup> That is, two out of three traits in the case of ratings by faculty judges and six out of nine traits in the case of ratings by student judges, except for Institutions 23 and 28, in which instances only eight traits were counted, all ratings in one of the traits (*Unselfishness*) being eliminated as a result of unsatisfactory manifolding, which apparently led a number of the judges to overlook the trait entirely, or very nearly so. Further, in the actual application of this rule to the first of these institutions five out of eight traits were taken as equivalent to two-thirds.

<sup>5</sup> Provided the number of judges for the institution in question was not restricted to two, in which case the more stringent rule was applied.

<sup>6</sup> The expression *the number taken as the norm* refers to the number of students in terms of which the ratings were transmuted in making the ranks assigned by one judge comparable with those assigned by another judge, a process which will shortly be explained.

by faculty and student judges, with this exception, again, that for institutions numbering more than fifty students in the senior class one-third of this number was allowed in the case of ratings by both types of judges. Similarly, judges who submitted irregular ratings which were not differentiated to the extent of one-third of the number of retained students rated, judges who submitted descriptive ratings, and judges who submitted ratings specifically stated to have been based on college marks,<sup>7</sup> were eliminated as required in the particular traits concerned.<sup>8</sup> Finally, after the necessary judges had been eliminated, the remaining ratings were again inspected, and the additional students affected by the cutting out of a given judge were eliminated, unless there still remained at least two acceptable judgments for each student retained as a subject, in all of the traits or in two-thirds of the traits as the case might be.

In a number of institutions this selection of the more adequate data did not result in the elimination of a single student in the group of seniors for whom ratings were requested. In a majority of instances, however, this proved not to be the case, the number of students retained as subjects frequently being considerably less than the number of students for whom ratings were requested, principally in the case of those institutions which failed to be selected for representation in the conclusions of the investigation because of the relatively unsatisfactory quality of the data contributed. At the same time, the elimination of judges was less often required, the number of judges retained in the results in more than half the cases being the same as the number submitting ratings. As a result of the elimination of both students and judges, the number of ratings retained in the results was rarely the number submitted. As a rule, however, in the case of the selected institutions at least, a satisfactory proportion of the ratings received could be utilized.<sup>9</sup>

After the elimination of inadequate data, the next step in the treatment of faulty data was the reranking of the retained ratings of the different judges. If appropriate, this step was undertaken

<sup>7</sup> This rule applies only to the trait *Intellect as Shown in Studies*.

<sup>8</sup> It should be noted that the retained judges were not necessarily the same persons throughout the several traits.

<sup>9</sup> Specific information regarding the extent to which the data contributed proved adequate for retention in the investigation will be found in the interpretation of Table XI in the preceding chapter.



concurrently with the third step, which was concerned with making the ratings assigned by one judge roughly comparable with those assigned by another.

Aside from this process of equating the ratings assigned by the different judges, the processes involved in this reranking might include any or all of the following:

- (1) The correction of errors in the original ranking.
- (2) The distribution of tied ratings.
- (3) The alterations in the ratings incident to the discarding of any which did not prove sufficiently adequate for retention.

Although the ratings submitted by many of the judges called for this reranking, the treatment required for a particular series was usually a simple matter, the problem solved in each case being to establish a normal rank-order series corresponding to the total number of retained subjects.<sup>10</sup>

The final step in the treatment of faulty data, undertaken in connection with the second step or independently of it, according to the method employed, was the equating of the ratings assigned by the different faculty or student judges so that they might be roughly comparable in the case of each institution.

For this purpose two methods were employed. The first of these methods involved the assumption that if most of the students for whom ratings had been requested were ranked by a given judge, omissions in his rankings were likely to be for students who were neither particularly good nor particularly bad with respect to the trait in question. Hence the method employed was that of displacing ranks toward the lower end of the rank-order series so that the lowest rank assigned by a given judge would be allotted the rank corresponding to the number of students retained as subjects, or to some other figure taken as the norm.<sup>11</sup> In the case of an even number of ranks the displacement occurred

<sup>10</sup> The presence of one type of error which conceivably crept in at times to mar the ratings, that of a complete reversal of a series of rankings, was not sufficiently established to call for correction. Although the ratings submitted were carefully inspected in every case to see whether this error had occurred, and although its presence was strongly suspected in at least two instances, it proved practically impossible to convict a judge on this score, either because the number of judges was too small or because the disagreement among the judges was too great to make certain the error had occurred.

<sup>11</sup> As would be expected, the number in terms of which the ratings were transmuted was ordinarily the total number of retained students; at other

between the two middle ranks, and in the case of an odd number of ranks, following the middle rank,<sup>12</sup> the number of omitted ranks in either case being sufficient to make up the difference between the number rated by the judge and the number of students taken as the norm. The method described was applied in every instance in which the omissions in the ratings did not exceed one-sixth in the case of ratings by faculty judges, nor one-fourth in the case of ratings by student judges.<sup>13</sup> These fractions were wholly arbitrary.

If the omissions in the ratings of a particular judge exceeded the maximum prescribed for the use of the first method, an entirely different method was applied. This method involved the assumption that if a comparatively small number of the students for whom ratings were requested were ranked by a given judge, omissions in his rankings were likely to be for students distributed more or less at random among the students to be rated with respect to the trait in question. Hence the method employed was that of multiplying ranks by a constant so that the lowest rank assigned by a given judge would be increased until it corresponded to the number of students retained as subjects, or to some other figure taken as the norm.<sup>14</sup>

By one or the other of these methods the ratings assigned by the different judges for the institution in question in the several traits were rendered roughly comparable to one another, and were thus made ready for the application of the procedures required in the correlational analysis of the data.

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times, however, the number taken as the norm might be the highest number of retained students ranked by any judge, or a number approximately midway between the lowest and the highest number of retained students ranked by any retained judge, if the equating of the ranks appeared to be more satisfactorily handled in that way.

<sup>12</sup> The assumption in the latter case being that a student not ranked by a given judge would be more likely to fall in the last than in the first half of the number rated. The original rank order, moreover, was not interrupted in any case before ties involving the median of the ranks actually assigned had been distributed in routine fashion.

<sup>13</sup> That is, in every instance in which the quotient obtained by dividing the number of retained students ranked by a given judge into the number of students taken as the norm did not exceed 1.20 in the case of ratings by faculty judges, nor 1.33 in the case of ratings by student judges.

<sup>14</sup> This method was also employed in the rare instances in which the number of students rated by a given judge exceeded the number taken as the norm, the multiplier in such cases being less than 1.00.

## SECTION 3

AN EXPLANATION OF THE PROCEDURES REQUIRED IN THE  
CORRELATIONAL ANALYSIS OF THE DATA

As already explained in the first section of this chapter, the method of recording the data provided for two measures of each trait, the ratings received from the different faculty or student judges being separated into two random halves in such fashion that approximately the same number were included in each half.

In view of the fact that more than one series of ratings was typically assigned to each random half of the data, a preliminary procedure required in the correlational analysis of the data was that of ascertaining the central tendency of the equated ratings for each student retained as a subject in the two halves of the data. For this purpose the median judgment was chosen as the most satisfactory measure. Should three or more judgments for a given student for each half of the data be available, the simple median was obtained in routine fashion. If, however, two ratings had been assigned, the mean of the two ratings was taken, or if but one, the single available rating was utilized. In case no ratings whatever had been submitted for a particular student in a given half of the data, it became necessary to supply a judgment. In such instances the middle rank or its near equivalent was customarily supplied in the median column.<sup>15</sup>

<sup>15</sup> If the number in terms of which the ratings were transmuted was not the total number of retained students, in place of this procedure the corresponding figure in a series of ranks based upon the number taken as the norm was supplied in the median column obtained in the manner described above, or the middle rank or its near equivalent in a series of ranks based upon the total number of retained students was supplied in the rank column obtained by the procedure next to be described. In instances involving an even number of cases it was assumed (much as in the first method of equating the ratings of the different judges) that a student who had not been rated would be in the last half rather than the first half of the number of students retained as subjects. Hence in these cases the second of the two middle ranks was assigned. For a similar reason, in supplying omissions in the rank column rather than the median column, no assignment was made until ties involving the median had been distributed. Furthermore, the rank actually supplied was also dependent upon the number of omissions, an average of the positions which would be occupied by the supplied ranks being assigned in the routine manner of distributing tied rankings.

Although differing slightly in detail, it is evident that the three methods described served the same purpose. The third method is of particular interest because it was the one usually adopted for filling in omissions in random halves in the studies of college marks and extra-curricular activities.

Since the original data of the study had been expressed in terms of ranks, the rank-difference method was chosen as the most appropriate for the correlational analysis of the data. Hence a further procedure required at this time was that of reducing each series of median judgments obtained for the two halves of the data in the case of each trait to a rank-order series providing for all the students retained as subjects in the investigation. The necessary ranking was accomplished in routine fashion.

As soon as the two series of ranks derived from the median judgments for each trait had been obtained, the procedure involved in the correlational analysis of the data was regular. Thus for the calculation of all uncorrected coefficients the usual formula, given below, was used:

$$\rho = 1 - \frac{6\Sigma D^2}{n(n^2 - 1)} \quad (\text{cf. 192, p. 162}).^{16}$$

However, since provision had been made for correction for attenuation by correlating alternate halves of the data, an unusually large number of coefficients had to be obtained.

The particular formula chosen for the purpose of correcting for attenuation was the one considered most satisfactory by Thorndike of those originally proposed by Spearman, and is as follows:

$$r_{pq} = \frac{\sqrt{(r_{p1q2}) (r_{p2q1})}}{\sqrt{(r_{p1p2}) (r_{q1q2})}} \quad (\text{cf. 192, p. 179}).$$

Theoretically, the application of this formula to the study of the relation between moral and intellectual traits involved the calculation of three reliability coefficients, six alternate coefficients,<sup>17</sup> and three corrected coefficients of correlation between the traits

<sup>16</sup> All coefficients calculated by this formula were converted into product-moment values by means of the table provided for the purpose (cf. 192, p. 225), before use in the correction for attenuation formula. In the case of coefficients presented in Appendix II, however, the untransmuted  $\rho$ 's only are reported.

<sup>17</sup> Throughout this investigation, and likewise elsewhere in the research, the term *alternate coefficients* is used to refer to the two uncorrected coefficients calculated between the alternate halves of the data for the measures correlated, or between the two halves of the data for one measure and the undivided data for the other measure, the term *raw coefficient* being reserved for uncorrected coefficients calculated between single measures or from undivided data reported in the same tables with alternate coefficients in the two investigations by the author.

*Morality in the Broadest Sense, Intellect as Shown in Studies, and Intellect as Shown in Activities Other than Studies* for each of the twenty-eight institutions represented by ratings by faculty judges; and nine reliability coefficients, seventy-two alternate coefficients, and thirty-six corrected coefficients between the traits *Unselfishness, Loyalty to School and Friends, Justice to All, Courage in Support of Convictions, Self-Control, Activity for Social Welfare, Reliability, Intellect as Shown in Studies, and Intellect as Shown in Activities Other than Studies* for each of the eight institutions represented by ratings by student judges. Actually, the complete schedule of correlational results could be carried out for 12 or more retained students for the sixteen selected institutions and for from 8 to 21 retained students for three of the twelve non-selected institutions in the case of ratings by faculty judges, and for four of the five selected institutions in the case of ratings by student judges,<sup>18</sup> the schedule being modified to a greater or less extent in the remaining instances as a result of insufficient data, a representation in the number of students retained as subjects of not less than one-third of the number of students for whom ratings were requested being taken as the minimum requirement for the report of routine correlational results in the case of ratings by faculty judges.

It should be noted, however, that, even if computed, corrected coefficients have not always been reported, and, even if reported, alternate and corrected coefficients have not necessarily been included in the interpretation of results, because of the unsatisfactory character of the data. Thus no corrected coefficients will be found in the tables presenting the correlational results for non-selected institutions, and a few omissions occur in the tables presenting these results for selected institutions.<sup>19</sup> Furthermore, the conclusions of the investigation are based solely upon the results for selected institutions, and even in these cases certain alternate and corrected coefficients have been excluded from consideration

<sup>18</sup> Except for the systematic omission of all correlations with the trait *Unselfishness*, a necessity arising from an inadequacy in the data previously described, the complete schedule was also carried out for the remaining selected institution and one of the unselected institutions in the case of ratings by student judges.

<sup>19</sup> An explanation of the evaluation of the data, which includes a detailed account of the separation of the institutions cooperating in the investigation into selected and non-selected institutions, is given in the succeeding chapter.

and (if reported) have likewise been omitted in the various compilations of correlational results. The explanation for these omissions in report and interpretation in the case of the non-selected institutions is of course the general inadequacy of the ratings submitted. The explanation in the case of the selected institutions is more complicated, but centers in the failure of the particular data involved to meet certain requirements as to reliability and consistency which it proved desirable to formulate.<sup>20</sup>

In addition to the routine correlational results calculated in the case of all the selected institutions and certain of the non-selected institutions, and the irregular coefficients calculated in the case of the remaining non-selected institutions, supplementary coefficients of correlation were also calculated in the case of a number of institutions in order to utilize the data more fully.<sup>21</sup> It should be noted, however, that although every institution contributing data to the research is represented in the coefficients reported, only the routine correlational results for selected institutions receive formal consideration in the interpretation of results.<sup>22</sup>

As the study progressed, the value of obtaining a composite judgment of morality and of intellect on the basis of the available ratings in the various moral and intellectual traits, at least for a

<sup>20</sup> Detailed rules governing the report and the interpretation of routine correlational results obtained for selected institutions, which are in certain respects closely related to the criteria for evaluating the ratings assigned by faculty and student judges formulated in the succeeding chapter, will be found in Appendix II, Section 2.

It will be observed that the application of these rules eliminated from consideration a number of corrected coefficients which exceeded 1.00. It is of course recognized that such coefficients represent absurd results unless the "corrected coefficients differ from 1.00 by such small amounts that the value 1.00 is well within the likelihood of occurrence, judged by the probable errors of the corrected coefficients" (cf. 154, p. 212).

<sup>21</sup> In general, supplementary coefficients were computed for all faculty judges who had rated at least 10 students in all three traits, but whose ratings could not be included in the principal correlational results for the institution in question because the judge concerned had not rated the required proportion of the students retained as subjects. In the case of an additional institution, however, a supplementary coefficient representing only 8 students was calculated for a judge who had rated all the seniors in a college in the university concerned other than the college represented by the regular group of retained students, a ninth student rated by this judge but not in the same college being excluded in the calculations.

<sup>22</sup> Correlational results obtained for non-selected institutions and supplementary coefficients of correlation calculated for selected institutions are presented in Appendix II, Section 3, while all routine correlational results for selected institutions are presented in Part II in Chapter XIX.

number of selected institutions, became apparent. Hence the last procedure required in the correlational analysis of the data was concerned with providing a rank-order series for these composites to make possible the usual pattern of correlational analysis.

It will be recalled that faculty judges submitted ratings in one moral trait and two intellectual traits, and that student judges submitted ratings in seven moral traits and two intellectual traits. The composites that could be obtained under these circumstances are indicated below:

FOR RATINGS BY FACULTY JUDGES: a composite of the two intellectual traits *Intellect as Shown in Studies* and *Intellect as Shown in Activities Other than Studies*.

FOR RATINGS BY STUDENT JUDGES: a composite of the seven moral traits *Unselfishness*,<sup>23</sup> *Loyalty to School and Friends*, *Justice to All*, *Courage in Support of Convictions*, *Self-Control*, *Activity for Social Welfare*, and *Reliability*, and a composite of the two intellectual traits *Intellect as Shown in Studies* and *Intellect as Shown in Activities Other than Studies*.

Since in order to permit the application of the usual correlational procedure two measures of each composite were necessary, the procedure adopted was as follows:

As the first measure of a given composite, the sum of the median judgments in the first half of the data for the several traits to be combined was obtained, and the resulting series of sums was ranked in order to provide the rank-order series required.

As the second measure of this composite, the sum of the median judgments in the second half of the data for the several traits to be combined was obtained, and the resulting series of sums was ranked as before.<sup>24</sup>

In this manner the necessary measures for correlational analysis

<sup>23</sup> Unless this trait had been eliminated in the data subjected to correlational analysis as a result of unsatisfactory manifolding, as previously explained.

<sup>24</sup> Instead of the procedure calling for the sum of the median judgments as the basis of the composite rating, a procedure based on the sum of the ranks assigned to the two series of median judgments was worked out and applied in the case of two institutions. Although the procedure utilizing the sum of the ranks resulted in a greater differentiation in the data for the individual subjects, the procedure utilizing the sum of the median judgments was finally preferred because it dealt with more nearly original measures and was more defensible statistically.

As would naturally be expected, incomplete correlational results obtained for the sum of the ranks for the two institutions were in substantial agreement with the corresponding results obtained for the sum of the medians.

were obtained for ratings by faculty and student judges in the case of five selected institutions, as follows:

Cornell College

Municipal University of Akron

Lincoln University

Whitman College

William Woods College

It will be observed that the five institutions thus included in the study comprise all of the selected institutions represented by ratings by student judges.

Eventually a complete schedule of correlational results for correlations with composites was devised and carried out in its entirety for the five institutions in the case of ratings by both faculty and student judges.<sup>25</sup>

As a last step, in order to ascertain the degree of agreement between faculty and student judges, the data for single moral and intellectual traits and the composite of intellectual traits in the case of ratings by faculty judges, and for the composites of moral and intellectual traits<sup>26</sup> and for single intellectual traits in the case of ratings by student judges, were subjected to further correlational analysis. In this comparison, the five selected institutions included in the correlations between moral and intellectual traits and their composites were again included. In view of the fact that these five institutions comprise all of the selected institutions represented by ratings by student judges, it is evident that this comparison is based on all the data received in the investigation which were sufficiently adequate for the purpose.

Since only identical subjects rated by faculty and student judges could be considered in such a study, for the one institution in which the number of students retained as subjects in the case of ratings by faculty judges differed from the number retained in the case of ratings by student judges,<sup>27</sup> the data utilized in the routine correlational analysis of the ratings by student judges were reranked with all subjects eliminated who were not also represented in the corresponding data for faculty judges.<sup>28</sup>

<sup>25</sup> It should be noted that in the report and the interpretation of these coefficients the requirements as to reliability and consistency formulated for single trait correlations were again applied.

<sup>26</sup> It will be observed that the composite of moral traits for ratings by student judges provided a single measure which could conveniently be compared with the single moral trait for ratings by faculty judges.

<sup>27</sup> As it chanced, for the remaining institutions all the students for whom ratings were requested were retained as subjects in both series of ratings.

<sup>28</sup> To save unnecessary labor, in this reranking the median rank was sup-



Thereafter, a complete schedule of correlational results for cross-correlations of ratings by faculty and student judges was devised and carried out in its entirety for the five institutions in the case of ratings in analogous or identical traits, and also, with minor omissions for three institutions,<sup>29</sup> in the case of ratings in contrasting traits.<sup>25</sup>

Finally, the probable errors of the reliability and the alternate coefficients involved in the correlations with ratings by faculty and student judges were obtained in the following manner:

(1) Probable errors for reliability coefficients were calculated<sup>30</sup> by means of suitable formulae.<sup>31</sup>

(2) Approximate probable errors for alternate coefficients<sup>32</sup> were obtained from the corresponding P.E. $r$  values by multiplying these figures as given in a P.E. $r$  table<sup>33</sup> by the required constant.<sup>34</sup>

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plied in each column for one student included in the number retained as subjects in the ratings by faculty judges but excluded from this number in the ratings by student judges.

<sup>29</sup> These omissions occurred only in the case of correlations between the composite of seven moral traits for ratings by student judges and the single intellectual traits for ratings by faculty judges.

<sup>30</sup> In these calculations the reliability coefficients reported in the tables carried out to four decimal places were used.

<sup>31</sup> The particular formula utilized depended principally on the number of cases involved. Thus if  $N$  equalled or exceeded 25, Formula 37 given by Garrett (cf. 144, p. 191) was used, and if  $N$  was less than 25 and  $r$  was less than .95, Formula 108c given by Kelley (cf. 154, pp. 176-77) was adapted for use by inserting the constant required when the probable error of a rank-difference coefficient rather than the standard deviation of a product-moment coefficient is required, the transmuted values of  $\rho$  being substituted in the formula.

<sup>32</sup> The probable errors for these alternate coefficients are not reported in the investigation, but were used in the application of one of the criteria for evaluating the data, as indicated in the definition of the standards for the criteria employed in the evaluation of the data, as given in Appendix II, Section 4.

<sup>33</sup> The particular P.E. $r$  table used was the one prepared by Toops and Miner (197).

<sup>34</sup> Since the probable error of  $\rho$  is "approximately 5 per cent greater than the probable error of  $r$ " (cf. 154, p. 194), the multiplier used was 1.05.

## CHAPTER XVIII

### AN EXPLANATION OF THE EVALUATION OF THE DATA

AN EXPLANATION of the evaluation of the data given in the two sections of this chapter includes a general account of the criteria employed in the evaluation of the data, and an analysis of the final grades and the composite scores obtained as a result of the application of the criteria employed.

#### SECTION I

##### A GENERAL ACCOUNT OF THE CRITERIA EMPLOYED IN THE EVALUATION OF THE DATA

It is evident from the information presented in the two preceding chapters that the data contributed by the twenty-eight institutions cooperating in the investigation varied greatly in adequacy, and that the original inequalities in the returns were complicated by the procedure employed in the treatment of faulty data.

As a result of these considerations, a careful evaluation of the data for the various institutions, based upon the ratings in moral and intellectual traits submitted by faculty and student judges, appeared to be a prerequisite to a proper interpretation of results. The individual criteria adopted for this purpose were as follows:

1. The number of students retained as subjects.
2. The percentage of the students for whom ratings were requested represented by the students retained as subjects.
3. The average number of judges retained in each trait.
4. The average number of ratings retained per student per trait.
5. The reliability of the ratings as evidenced by the relation of the reliability coefficients to their probable errors.
6. The consistency of the ratings as evidenced by the agreement between the alternate coefficients.

To evaluate these individual criteria, two sets of standards, the one for ratings by faculty judges and the other for ratings by student judges, were defined for five separate grades, designated Grades A, B, C, D, and E, respectively.<sup>1</sup>

In the formulation of these standards Grade A indicated data more or less ideal in character, although subject in its definition to the practical limitations of the data actually contributed, and Grades B and C indicated progressively less satisfactory data, still however fairly adequate; while Grade D was sufficiently un-exacting to include all the data not subsumed under the three higher grades which appeared to merit formal consideration in the interpretation of results,<sup>2</sup> and Grade E was restricted to data which did not appear to merit such consideration. Incidentally, in order to provide for the subsequent calculation of a composite score for each series of ratings in the case of each institution, a weight was arbitrarily assigned to each of the five grades thus defined, the weights in order being 4, 3, 2, 1, and 0;<sup>3</sup> these weights, however, served no function in the actual evaluation of the data. In addition, in order to make possible a qualitative as well as a quantitative summation of the grades assigned on the basis of the individual criteria, a total of 20 credits was distributed among the six criteria. The number of credits assigned to each criterion was dependent upon the relative importance of the criterion in question, as subjectively determined, the credits for the six criteria in order being 5, 2, 3, 3, 4, and 3.

After the definition of the standards for each criterion, the six criteria specified above were applied individually to the data contributed by the twenty-eight institutions cooperating in the investigation, and a grade of A, B, C, D, or E was assigned on the basis of each criterion to the ratings submitted by both faculty and student judges. Thereafter, a combined criterion, consisting in a quantitative and a qualitative summary of the credits earned as a result of the application of the six criteria, was formulated. In

<sup>1</sup> A definition of the standards for the criteria employed in the evaluation of the data with the grades assigned as the result of each criterion will be found in Appendix II, Section 4.

<sup>2</sup> Unless they failed to meet the requirements as to reliability and consistency referred to in the last section of the preceding chapter, and stipulated in Appendix II, Section 2.

<sup>3</sup> Although identical in numerical value, the weights corresponding to a given grade should not be confused with the qualitative weights assigned to the coefficients, which are shortly to be explained.

this instance, also, standards were defined in the case of both series of ratings for five separate grades, again designated Grades A, B, C, D, and E, respectively. These five grades represented data varying in quality from very satisfactory to very inferior as judged by the standards defined for the six individual criteria.

It is noteworthy that, according to the definition of the standards for the combined criterion in the case of ratings by both faculty and student judges, the assignment of a grade of E on the basis of any one of the six individual criteria—whatever the grades assigned on the basis of the other criteria—automatically excluded that series of ratings for the institution concerned from formal consideration in the interpretation of results.

The application of the combined criterion and the assignment of the corresponding grades determined the final grade assigned to the ratings for both faculty and student judges in the case of all the institutions cooperating in the investigation. It should be noted, however, that in the case of any particular institution the final grade assigned to the ratings by faculty judges might not correspond to the final grade assigned to the ratings by student judges, since the grades assigned to the two series of ratings were in each case dependent upon the definition of standards for the series concerned, and independent of each other.

The final grades assigned to the ratings in their turn determined the qualitative weights assigned to the coefficients in the interpretation of results, a grade of A being arbitrarily assigned a weight of 4, a grade of B a weight of 3, a grade of C a weight of 2, a grade of D a weight of 1, and a grade of E a weight of 0.

As a result of this method of grading, the ratings by faculty judges contributed by sixteen of the twenty-eight institutions represented by faculty judges, and the ratings by student judges contributed by five of the eight institutions represented by student judges, were assigned final grades of A, B, C, or D; whereas the remaining institutions in each case were assigned a final grade of E.

Since the assignment of one of the four highest grades was required if a series of ratings for a particular institution was to receive formal consideration in the interpretation of results, in the case of ratings by both faculty and student judges, the institutions contributing data to which the four highest grades were assigned were classed together under the designation *Selected In-*

stitutions,<sup>4</sup> and the correlational results obtained from the ratings so graded are presented in Part II;<sup>5</sup> whereas the institutions contributing data to which the lowest grade was assigned were classed together under the designation *Non-Selected Institutions*, and the correlational results obtained from the ratings so graded are presented in Appendix II.<sup>6</sup>

Although the most important use of the criteria described above was the qualitative weighting of the coefficients in the interpretation of results in accordance with the final grades assigned to the ratings, a minor purpose was served in the calculation of composite scores permitting a differentiation in the quality of the ratings to which the same final grade had been assigned. The method of calculating these composite scores was as follows:

(1) The grades assigned to ratings by faculty judges and ratings by student judges in the case of the individual criteria were weighted according to the quality of the data represented, Grade A receiving a weight of 4, Grade B a weight of 3, Grade C a weight of 2, Grade D a weight of 1, and Grade E a weight of 0.

(2) The resulting figures for both faculty and student judges in the case of each criterion were multiplied by the number of credits assigned to the criterion in question, the appropriate multipliers being 5, 2, 3, 3, 4, and 3 for the six criteria in order.

(3) The sum of the weighted credits thus obtained was found separately for the ratings by faculty judges and the ratings by student judges,<sup>7</sup> in order to determine the composite score of the ratings submitted by each type of judge for the institution in question.

These composite scores for their part provided an objective

<sup>4</sup> The information regarding these institutions is printed in italics in the key to the institutions cooperating in the investigation, presented in Appendix II, Section 1.

<sup>5</sup> Barring supplementary coefficients of correlation of slight importance, referred to in the last section of the preceding chapter, which were presented in Appendix II.

<sup>6</sup> Since the sixteen institutions represented by relatively adequate data submitted by faculty judges included the five institutions represented by data of a similar quality submitted by student judges, the total number of selected institutions is sixteen. It should be noted, however, that one of the institutions contributing satisfactory data in the case of ratings by faculty judges failed to do so in the case of ratings by student judges, and as a result the institution in question is classed among the selected institutions in a consideration of the ratings by faculty judges, and among the non-selected institutions in a consideration of the ratings by student judges.

<sup>7</sup> If both types of ratings were available; otherwise, for the ratings by faculty judges only.

means of arranging the data for the different institutions in order of merit in the various tabulations. It should be noted, however, that the function of the composite scores was limited to determining the relative position of the institutions contributing ratings to which the same final grade had been assigned,<sup>8</sup> and that in the case of the institutions to which a final grade of E was assigned they were further conditioned in their application by the type and the number of coefficients calculated for a given institution, these very practical considerations constituting the primary factor in determining the arrangement of the tabulation in which the results for the non-selected institutions are presented.

## SECTION 2

### AN ANALYSIS OF THE FINAL GRADES AND THE COMPOSITE SCORES OBTAINED AS A RESULT OF THE APPLICATION OF THE CRITERIA EMPLOYED

As a means of determining the effectiveness of the evaluation of the data, it will be of interest to analyze the final grades and the composite scores obtained as a result of the application of the several criteria described in the preceding section.<sup>9</sup>

An analysis of the final grades assigned to the ratings by faculty and student judges received from the institutions cooperating in the investigation, as these grades have already been recorded in Table XI, is given in the tabulation on the following page.

The information afforded by this analysis of final grades may be interpreted briefly as follows:

(1) The piling up of the frequencies toward the lower grades in the case of the selected institutions and the comparatively large number of non-selected institutions clearly show the rigorousness of the selection imposed by the criteria employed.

(2) Except for the excessive number of "Failures" (designated by Grade E), the assignment of final grades in the case of ratings by both faculty and student judges approximates an ideal distribution

<sup>8</sup> In the case of ties in the composite scores, the final order of institutions was determined by a comparative qualitative analysis of the ratings contributed by the tied institutions.

<sup>9</sup> The success of the project will be further tested in a comparison between a quantitative and a qualitative method of weighting the correlational results of the investigation, presented in the last section of Chapter XXII.

Final Grade Assigned to Ratings	No. of Institutions with Ratings of a Given Final Grade	
	<i>Ratings by</i>	<i>Ratings by</i>
	<i>Faculty Judges</i>	<i>Student Judges</i>

## SELECTED INSTITUTIONS

A .....	2	1
B .....	4	0
C .....	6	4
D .....	4	0

## NON-SELECTED INSTITUTIONS

E .....	12	3
---------	----	---

according to the normal curve, in spite of the limited data upon which to base the distribution.

(3) Although the excessive number of institutions with data represented by the lowest grade in this assignment of final grades could have been avoided by a less rigorous standard for Grade E, or possibly by a more generous use of follow-up letters, it is evident that the large number of non-selected institutions is hardly a serious matter, inasmuch as the data represented by the sixteen selected institutions appear to be sufficient for the purposes of the investigation.

An analysis of the composite scores used in determining the order of institutions in the various tables reporting the results of the investigation, as these scores have already been recorded in Table XI, is given in the following tabulation:

Composite Score Used in Determining Order of Institutions	No. of Institutions with Specified Composite Scores	
	<i>Ratings by</i>	<i>Ratings by</i>
	<i>Faculty Judges</i>	<i>Student Judges</i>

## SELECTED INSTITUTIONS

70-79 .....	4	1
60-69 .....	3	0
50-59 .....	5	2
40-49 .....	1	2
30-39 .....	2	0
20-29 .....	1	0

## NON-SELECTED INSTITUTIONS

50-59 .....	1	0
40-49 .....	0	0
30-39 .....	1	0
20-29 .....	1	0
10-19 .....	4	0
0-9 .....	5	3

The information afforded by this analysis of composite scores may be interpreted briefly as follows:

(1) The comparatively large number of frequencies opposite the higher composite scores in the case of the selected institutions and the almost complete absence of such frequencies in the case of the non-selected institutions clearly show the superiority of the data chosen as the basis for the conclusions of the investigation.

(2) The composite scores for the institutions contributing ratings by faculty judges, and likewise for the institutions contributing ratings by student judges, vary greatly, in each case including one or more representatives in the highest and the lowest classes.<sup>10</sup>

Lastly, it is of interest to note that a comparison of the final grades and the composite scores for the different institutions<sup>11</sup> discloses in the first place that the composite scores for any one group of institutions represented by ratings to which a given final grade had been assigned in general differ but little from each other in the case of the selected institutions, and in the second place that if the order of institutions had been determined solely on the basis of their composite scores, the resulting order would have differed very little from the present order in the case of the selected institutions, but would have suffered considerable change in the case of the non-selected institutions.<sup>12</sup>

From the facts presented in this section it may be concluded that the evaluation of the ratings by faculty and student judges, taken as a whole, has been accomplished very satisfactorily by the several criteria employed.

<sup>10</sup> The actual range of composite scores is from 72 to 0 in the case of ratings by faculty judges, and from 74 to 4 in the case of ratings by student judges.

<sup>11</sup> Such a comparison can be made by reference to Table XI.

<sup>12</sup> The only notable instances of change, however, would have been Institutions 6 and 10 in the case of ratings by faculty judges, which would have been classed among the selected institutions rather than among the non-selected institutions on the basis of composite score alone.



## CHAPTER XIX

### THE PRESENTATION AND INTERPRETATION OF THE CORRELATIONAL RESULTS FOR RAT- INGS BY FACULTY AND STUDENT JUDGES

THE presentation and interpretation of the correlational results for ratings by faculty and student judges included in this chapter is concerned with the following series of coefficients: (1) coefficients of correlation between ratings in moral and intellectual traits by faculty judges; (2) coefficients of correlation between ratings in moral and intellectual traits by student judges; (3) coefficients of intercorrelation between ratings in moral traits by student judges; (4) coefficients of correlation between ratings in moral and intellectual traits and composites of ratings in moral and intellectual traits; and (5) coefficients of cross-correlation between ratings by faculty judges and ratings by student judges. The several series of coefficients enumerated will be considered in order in the succeeding sections.

#### SECTION I

##### COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS BY FACULTY JUDGES

Table XIII presents coefficients of correlation between ratings in moral and intellectual traits by faculty judges. This table and the succeeding table, which presents the corresponding coefficients for ratings by student judges, are of particular interest because they afford the most important evidence obtained in the investigation as to the relation between moral and intellectual traits.

The table includes the key number of the institution for the sixteen selected institutions represented, the final grade assigned to the ratings by faculty judges, the number of students retained as subjects in the investigation, the number of judges and the number of ratings retained in each of the three traits, the average

TABLE XIII  
COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS  
BY FACULTY JUDGES<sup>a</sup>

KEY No. of Insti- tution	FINAL GRADE AS- SIGN- ED TO RATINGS	No. of STU- DENTS RE- TAINED	No. of JUDGES RETAINED			No. of RATINGS RETAINED	AV. No. of RAT- INGS RE- TAINED PER STU- DENT PER TRAIT	RELIABILITY COEFFICIENTS WITH PROBABLE ERRORS			ALTERNATE COEFFICIENTS <sup>b</sup>						CORRECTED COEFFICIENTS <sup>b</sup>			QUALI- TATIVE WEIGHT ASSIGNED TO COEF- FICIENTS
								MIM2	ISIS2	IAIA2	MIS2	MIS1	M1A2	M2IA1	ISIA2	ISIA1	M IS	M IA	IS IA	
20	A	40	6	5	232	220	189	.87±.03	.78±.04	.76±.05	.65	.48	.53	.49	.72	.77	.67	.63	.96	4
12	A	37	5	5	145	145	145	.76±.05	.69±.06	.70±.06	.26	.46	.45	.55	.59	.62	.48	.68	.87	4
22	B	32	5	6	146	173	136	.48±.10	.79±.05	.67±.07	.44	.45	.38	.21	.77	.78	.72	.50	1.06	3
25	B	25	5	5	121	120	120	.54±.10	.73±.07	.63±.09	.34	.26	—	.01	.27	.24	.48	—	.38	3
14	B	93	4	3	332	333	256	.65±.04	.71±.04	.57±.05	.46	.48	.44	.39	.54	.39	.69	.68	.73	3
1	B	40	5	5	119	119	119	.53±.08	.53±.08	.30±.10	.01	.15	.18	.12	.17	.17	.07	.36	.42	3
28	C	26	5	5	112	112	112	.55±.10	.61±.09	.55±.10	.22	.33	.07	.00	.74	.22	.47	.07	.70	2
11	C	44	4	4	123	142	131	.61±.07	.66±.06	.52±.08	.43	.49	.18	.60	.32	.45	.72	.68	.65	2
2	C	43	2	2	86	86	86	.51±.08	1.00±.00	.59±.07	.41	.29	.55	.68	.28	.27	.77	1.12	.86	2
16	C	17	5	5	80	78	80	.82±.06	.82±.06	.55±.13	.50	.54	.25	.45	.44	.77	.63	.50	.86	2
21	C	24	4	4	84	84	86	.85±.04	.80±.06	.68±.08	.77	.57	.28	.23	.49	.15	.80	.03	.23	2
23	C	40	4	4	121	122	58	.34±.09	.56±.07	.27±.10	.34	.44	.43	.42	.44	.39	.88	1.38	1.06	2
26	D	54	2	3	84	135	135	—	.02±.10	.58±.06	.25	.19	.26	—	.04	.56	.44	.31	.89	1
9	D	45	2	3	57	100	100	.33±.09	.63±.06	.24±.10	.51	.17	.30	.13	.20	.29	.64	.31	.12	1
19	D	17	3	3	4	40	41	.31±.16	.73±.08	.20±.17	.48	.26	.05	.41	.14	.02	.71	.35	.85	1
15	D	12	2	2	24	24	24	.68±.13	.50±.17	.79±.09	.44	.45	.57	.69	.57	.56	.76	.85	.90	1

KEY TO SYMBOLS

M Morality in the Broadest Sense.

IS Intellect as Shown in Studies

Subscript 1 First Half of Data.

Subscript 2 Second Half of Data.

IA Intellect as Shown in Activities Other than Studies.

<sup>a</sup> Coefficients of correlation between ratings in moral and intellectual traits by faculty judges corresponding to the coefficients presented in this table are included among correlational results obtained for non-selected institutions and supplementary coefficients of correlation calculated for selected institutions as presented in Appendix II, Section 3, A. It will be observed that, in spite of the relatively unsatisfactory quality of the data involved, approximately five-sixths of the 43 alternate or raw coefficients reported therein which are of significance in a study of this relationship confirm the evidence afforded by the coefficients reported above of a direct relation between moral and intellectual traits.

<sup>b</sup> Alternate coefficients which correspond to omitted or italicized corrected coefficients, and likewise italicized corrected coefficients, are disregarded in subsequent discussion, and also (if pertinent) in the compilations of correlational results, because the data involved failed to meet the requirements as to reliability and consistency formulated in the course of the investigation (cf. Appendix II, Section 2).

number of ratings retained per student per trait in the correlational analysis of the data, the reliability coefficients for the traits correlated with their probable errors, the alternate and the corrected coefficients calculated between ratings in moral and intellectual traits for faculty judges, and the qualitative weight assigned to the coefficients for each institution in the compilation of correlational results.

The traits correlated in this series of coefficients for ratings by faculty judges are given below:

- Morality in the Broadest Sense (*M*) with
  - Intellect as Shown in Studies (*IS*), and Intellect as Shown in Activities Other than Studies (*IA*).
- Intellect as Shown in Studies (*IS*) with
  - Intellect as Shown in Activities Other than Studies (*IA*).

Of the resulting coefficients, the first two are of significance in a consideration of the relation between moral and intellectual traits; and the third, in a consideration of the relation between intellectual traits.

The coefficients of correlation between ratings in moral and intellectual traits by faculty judges presented in Table XIII afford practically consistent evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

- (1) There are sixteen institutions represented in the coefficients calculated from ratings by faculty judges.
- (2) The final grades assigned to the ratings range from A to D, with C as the most frequent grade.
- (3) The number of students retained as subjects ranges from 93 to 12, with 40-49 as the most frequent interval, and with 595 as the total number of students retained.
- (4) The number of judges retained in the several traits ranges from 6 to 2, with 5 as the most frequent number.
- (5) The number of ratings retained in the several traits ranges from 333 to 24, with 100-199 as the most frequent interval.
- (6) The average number of ratings retained per student per trait varies from 5.34 to 1.90, with 2.00-2.99 as the most frequent interval.
- (7) The reliability coefficients for the several traits are high with one exception in the case of the two institutions in Group A, high

or marked with one exception in the case of the four institutions in Group B, high or marked with two exceptions in the case of the six institutions in Group C, and high or marked with five exceptions in the case of the four institutions in Group D; moreover, the reliability coefficients are more than ten times their probable errors in every instance for the two institutions in Group A, more than five times their probable errors in all but two instances for the four institutions in Group B, and in all but three instances for the six institutions in Group C, and less than five times their probable errors in one-half of the instances for the four institutions in Group D. At the same time, notwithstanding the assumed greater objectivity of the ratings in the two intellectual traits, the reliability coefficients for the one moral trait are higher than the corresponding reliability coefficients for the intellectual trait denoting abstract intelligence for four of the sixteen institutions and equal to them in two additional instances, and are higher than the corresponding reliability coefficients for the intellectual trait denoting social intelligence for ten of the sixteen institutions and equal to the corresponding coefficient in an additional instance.

(8) The alternate coefficients for the traits correlated, although at times widely divergent, meet the minimum standard of agreement required<sup>1</sup> in the case of the six pairs for the two institutions in Group A, the twelve pairs for the four institutions in Group B, fourteen of the eighteen pairs for the six institutions in Group C, and nine of the twelve pairs for the four institutions in Group D.

(9) The corrected coefficients for the traits correlated, although extremely variable, tend in general to be marked in the case of correlations between moral and intellectual traits, whether the intellectual trait correlated denotes abstract or social intelligence, and to be high in the case of intercorrelations between intellectual traits, as shown by the tabulation on the following page.

(10) The qualitative weights assigned to the coefficients range from 4 to 1 according to the final grades assigned to the ratings, with 2 as the most frequent weight.

A critical examination of the corrected coefficients with reference to various factors which may affect the degree of relationship found discloses further facts of interest, as follows:<sup>2</sup>

<sup>1</sup> If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

<sup>2</sup> Throughout this discussion italicized coefficients reported in Table XIII are disregarded because of the unsatisfactory character of the data from which they were derived.

The measure of central tendency upon which the several comparisons offered are based is the simple median of the appropriate results, the arrangement of the coefficients being on a scale from +1.00 to -1.00.

Traits Correlated	No. of Coeffi- cients <sup>a</sup>	Corrected Coefficients	
		<i>Weighted Quartile Points<sup>b</sup></i> <i>Median</i>	<i>Q<sub>1</sub> and Q<sub>3</sub></i>
Morality in the Broadest Sense ( <i>M</i> ) with Intellect as Shown in Studies ( <i>IS</i> ) .....	14	.66	.47 ... .72
Morality in the Broadest Sense ( <i>M</i> ) with Intellect as Shown in Activi- ties Other than Studies ( <i>IA</i> ) .....	10	.60	.37 ... .67
Intellect as Shown in Studies ( <i>IS</i> ) with Intellect as Shown in Activi- ties Other than Studies ( <i>IA</i> ) .....	11	.87	.67 ... .97

<sup>a</sup> All italicized coefficients reported in Table XIII are excluded in this tabulation.

<sup>b</sup> The method of weighting used in the tabulation is qualitative, the weight applied to each coefficient corresponding to the final grade assigned to the ratings by faculty judges for the institution in question.

(1) A comparison of the coefficients for the six institutions in Groups A and B with the coefficients for the ten institutions in Groups C and D seems to indicate that the quality of the data has a definite effect upon the degree of relationship found, since the coefficients for the institutions represented by the more satisfactory ratings tend to be lower in all three columns than the coefficients for the institutions represented by the less satisfactory ratings. However, this finding is not substantiated by the findings of two similar comparisons for a smaller number of institutions in the case of coefficients calculated from ratings by student judges presented in Tables XIV and XV.

(2) A comparison of the coefficients for the eight institutions represented by 40 or more students retained as subjects with the eight institutions represented by fewer than 40 students retained as subjects seems to indicate that the size of the senior class,<sup>3</sup> and therefore, presumably, the size of the institution, has an indifferent effect upon the degree of relationship found, since the coefficients for the institutions represented by the smaller senior classes tend to be lower in two columns and higher in one column than the

<sup>3</sup> The fact that the phrase *number of students retained as subjects* is generally synonymous in this investigation with the phrase *size of senior class* can be determined by reference to Table XI, in which it will be found that the eight institutions represented by the largest number of students for whom ratings were requested are identical with the eight institutions represented by 40 or more students retained as subjects.

coefficients for the institutions represented by the larger senior classes, the difference in one of the two former cases being clearly negligible. Moreover, this finding is in partial accord with the findings of two similar comparisons for the coefficients calculated from ratings by student judges referred to above.

(3) A comparison of the coefficients for the eight institutions represented by an average number of ratings retained per student per trait above 3.00 with the eight institutions represented by a similar average number of ratings of 3.00 or below seems to indicate that the number of judges combined with the extent of acquaintance with the students to be rated has a definite effect upon the degree of relationship found, since the coefficients for the institutions represented by the larger average number of ratings tend to be lower in all three columns than the coefficients for the institutions represented by the smaller average number of ratings. Moreover, this finding is apparently confirmed by two similar comparisons for the coefficients calculated from ratings by student judges already referred to, and is possibly due to the fact that an increase in the number of judges rating a given student may be expected to decrease the halo error.

(4) A comparison of the coefficients for the two exceptional institutions included in the table, namely, Institution 16, the one two-year college, which chances to be the only non-coeducational institution for women, and Institution 22, the one institution for students of a different race, which chances to be the only non-coeducational institution for men, with the central tendencies of the coefficients for the other fourteen institutions represented apparently lacks significance as an indication of the effect of type of institution, since, although the individual coefficients for the junior college for young women are lower in all three columns and the individual coefficients for the institution for Negro students are lower in one column and higher in two columns, than the central tendencies of the coefficients for the four-year coeducational colleges for white students, the fact that the coefficients for the exceptional institutions are in each case included within the range of the individual coefficients for the more typical institutions suggests that the factor under consideration may possibly be disregarded. Moreover, this suggestion is supported by the inconclusive findings of two similar comparisons for the results obtained from ratings by student judges already cited.

(5) A consideration of the type of students who customarily served as subjects in this investigation, namely, members of the senior class in four-year liberal arts colleges, who by virtue of their retention in the institution were presumably of good moral character, calls attention to the fact that such subjects constitute a selected group even among college students, who are themselves a

highly selected group in comparison with the general population; and suggests that, other things being equal, the degree of relationship found is doubtless considerably lower than the result to be expected without the restriction in range characteristic of the groups investigated.

(6) Lastly, a consideration of the general effect of the halo error suggests that, in spite of the numerous factors which are eliminated only in part by the operation of the correction for attenuation formula, and which presumably tend in the main to reduce the size of the coefficients, the values given in the table may be generally somewhat high.

In summary, then, it may be said that coefficients of correlation between ratings in moral and intellectual traits by faculty judges point to a direct and marked relation between moral character and intelligence among college students in the United States. Nevertheless, this result is doubtless affected by various extraneous and selective factors which probably tend on the whole to raise the degree of relationship found.

## SECTION 2

### COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS BY STUDENT JUDGES

Table XIV presents coefficients of correlation between ratings in moral and intellectual traits by student judges. As already indicated, this table and the preceding table, which presents the corresponding coefficients for ratings by faculty judges, are of particular interest because they afford the most important evidence obtained in the investigation as to the relation between moral and intellectual traits.

The table includes the key number of the institution for the five selected institutions represented, the final grade assigned to the ratings by student judges, the number of students retained as subjects in the investigation, the number of judges and the number of ratings retained in each of the nine traits, the average number of ratings retained per student per trait in the correlational analysis of the data, the reliability coefficients for the traits

TABLE XIV  
COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS  
BY STUDENT JUDGES<sup>a</sup>

Key No. of Institution	Final Grade Assigned to Ratings	No. of Students Retained as Subjects	No. of Judges Retained										No. of Ratings Retained										Av. No. of Ratings Retained per Student per Trait
			U	L	J	C	S	A	R	IS	IA	U	L	J	C	S	A	R	IS	IA			
9	A	77	37	37	35	35	35	35	33	31	30	747	744	718	718	701	678	616	550	537	8.67		
21	C	24	15	15	14	16	14	15	15	14	13	317	318	297	328	297	308	316	292	260	12.65		
16	C	17	16	16	16	16	16	16	16	16	16	261	261	238	261	260	260	260	260	261	15.31		
28 <sup>b</sup>	C	26	6	6	7	6	7	6	6	6	6	132	162	145	171	148	147	141	147	147	5.18 <sup>c</sup>		
22	C	32	9	8	8	8	8	7	7	7	7	272	250	250	250	250	216	215	213	212	7.39		

Key No. of Institution	RELIABILITY COEFFICIENTS WITH PROBABLE ERRORS										ALTERNATE COEFFICIENTS <sup>d</sup>					
	U1U2	L1L2	J1J2	C1C2	S1S2	A1A2	R1R2	IS1S2	IA1IA2	U1S2	U1L2	U1A2	U1I2			
9	.54±.06	.27±.07	.47±.06	.46±.06	.29±.07	.37±.07	.06±.08	.48±.06	.24±.08	.27	.20	.00	.14			
21	.32±.13	.81±.05	.48±.12	.12±.15	.36±.13	.65±.09	.61±.10	.42±.12	.69±.08	.45	.03	.44	.09			
16	.69±.10	.69±.10	.42±.15	.74±.09	.48±.14	.65±.11	.47±.14	.84±.06	.41±.15	.08	.45	-.04	-.01			
28	.49±.11	.49±.11	.44±.11	.34±.12	.55±.10	.63±.08	.62±.09	.86±.04	.67±.08	.14	.38	.14	.18			
22	.72±.06	.31±.11	.60±.08	.18±.12	.74±.06	.14±.12	.34±.11	.74±.06	.24±.12	-.14	-.38	.14	.18			



ALTERNATE COEFFICIENTS (Continued)

KEY NO. OF INSTI- TUTION	ALTERNATE COEFFICIENTS (Continued)																					
	L1S2	L2S1	L1A2	L2A1	J1S1	J1A2	J2A1	C1S2	C2S1	C1A2	C2A1	S1S2	S2S1	S1A2	S2A1	A1S2	A2S1	A1A2	A2A1			
9	.33	.26	.25	-.03	.45	.24	.31	.32	.18	.38	.30	.24	.30	.29	.35	.13	.22	.28	.32	.23		
21	.46	-.04	.68	.44	.55	-.06	.54	.34	.08	-.18	.30	.33	.15	-.19	.77	.41	.15	-.20	.50	.71		
16	.12	.41	-.03	.33	-.20	.61	-.30	-.01	.29	.46	.26	.39	.21	.13	-.49	-.33	.12	-.24	.41	.39		
28	.59	.18	.44	.36	.51	.18	.37	.28	.54	.22	.30	.37	.74	.45	.31	.46	.74	.33	.53	.68		
22	-.15	.08	-.01	.22	.07	.10	.09	-.12	.04	.26	.33	.26	.00	-.15	.32	-.13	-.14	-.24	-.27	-.14		

CORRECTED COEFFICIENTS<sup>d</sup>

KEY No. OF INSTI- TUTION	R1S1S2	R1IA1	R1IA2	R1S1	IS1IA1	IS1IA2	IS1IA1	U1S1	U1IA	L1S1	L1IA	J1S1	J1IA	C1S1	C1IA	S1S1	S1IA	A1S1	A1IA	R1S1	R1IA	IS1IA	IS1IA
9	.24	.12	.28	.09	.29	.23	.23	.46	.19	.82	.43	.69	.95	.56	.81	.80	.80	.59	.91	...	...	...	.77
21	.42	-.05	.63	.55	-.28	.21	.21	.32	.43	.36	.73	.54	.75	...	...	-.05	1.11	-.05	.89	.36	.91	-.07	.2
16	.18	.48	-.24	-.12	-.17	.03	.25	.25	-.04	.28	.29	.35	.44	.46	.72	.26	-.92	-.08	.78	.46	-.38	-.12	.2
28	.55	.49	.18	.33	.31	.51	.51	.70	.49	.50	.70	.49	.60	.63	.70	.83	.63	.67	.92	.71	.38	.53	.2
22	.48	-.16	.20	-.03	.20	.64	.64	-.31	-.05	-.07	.58	-.02	-.03	...	...	-.10	.23	...	...	.92	.29	.85	.2

## KEY TO SYMBOLS

U Unselfishness. L Loyalty to School and Friends. J Justice to All. C Courage in Support of Convictions. S Self-Control. A Activity for Social Welfare.  
 IS Intellect as Shown in Studies. IA Intellect as Shown in Activities Other than Studies.  
 Subscript 1 First Half of Data. Subscript 2 Second Half of Data.

<sup>a</sup> Coefficients of correlation between ratings in moral and intellectual traits by student judges corresponding to the coefficients presented in this table are included among correlational results obtained for non-selected institutions as presented in Appendix II, Section 3, B. It will be observed that, in spite of the relatively unsatisfactory quality of the data involved, approximately two-thirds of the 50 alternate or raw coefficients reported therein which are of significance in a study of this relationship confirm the evidence afforded by the coefficients reported above of a direct relation between moral and intellectual traits.

<sup>b</sup> The uniform omission of the trait *Unselfishness* in the results reported for Institution 28 is due to the comparatively small number of ratings assigned in that trait as a result of unsatisfactory manifesting.

<sup>c</sup> This figure is calculated on the basis of nine traits, as in the case of the other institutions for which results are reported in the table.

<sup>d</sup> Alternate coefficients which correspond to omitted or italicized corrected coefficients, and likewise italicized corrected coefficients, are disregarded in subsequent discussion, and also (if pertinent) in the compilations of correlational results, because the data involved failed to meet the requirements as to reliability and consistency formulated in the course of the investigation (cf. Appendix II, Section 2).

correlated with their probable errors, the alternate and the corrected coefficients calculated between ratings in moral and intellectual traits for student judges, and the qualitative weight assigned to the coefficients for each institution in the compilation of correlational results.

The traits correlated in this series of coefficients for ratings by student judges are given below:

Unselfishness (*U*), Loyalty to School and Friends (*L*), Justice to All (*J*), Courage in Support of Convictions (*C*), Self-Control (*S*), Activity for Social Welfare (*A*), and Reliability (*R*) with Intellect as Shown in Studies (*IS*), and Intellect as Shown in Activities Other than Studies (*IA*).

Intellect as Shown in Studies (*IS*) with

Intellect as Shown in Activities Other than Studies (*IA*).

Of the resulting coefficients, all but the last are of significance in a consideration of the relation between moral and intellectual traits, while the remaining coefficient is of significance in a consideration of the relation between intellectual traits.

The coefficients of correlation between ratings in moral and intellectual traits by student judges presented in Table XIV afford fairly consistent evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There are five institutions represented in the coefficients calculated from ratings by student judges.

(2) The final grades assigned to the ratings range from A' to C, with C as the grade in all but one instance.

(3) The number of students retained as subjects ranges from 77 to 17, with 26 as the median number, and with 176 as the total number of students retained.

(4) The number of judges retained in the several traits ranges from 6 to 37, with 16 as the most frequent number.

(5) The number of ratings retained in the several traits ranges from 747 to 141, with 200-299 as the most frequent interval.

(6) The average number of ratings retained per student per trait varies from 15.31 to 5.18, with 8.67 as the median number.

(7) The reliability coefficients for the several traits are marked or low in all but one of the nine instances in the case of the one

institution in Group A,<sup>4</sup> and high or marked in all but nine of the thirty-five instances in the case of the four institutions in Group C;<sup>5</sup> moreover, the reliability coefficients are more than five times their probable errors in five of the nine instances in the case of the one institution in Group A, and in eighteen of the thirty-five instances in the case of the four institutions in Group C. At the same time, notwithstanding the assumed greater objectivity of the ratings in the two intellectual traits, the reliability coefficients for one or more of the seven moral traits are higher than the corresponding reliability coefficients for the intellectual trait denoting abstract intelligence for two of the five institutions and equal to the corresponding coefficient in an additional instance, and are higher than the corresponding reliability coefficients for the intellectual trait denoting social intelligence for four of the five institutions.

(8) The alternate coefficients for the traits correlated, although at times widely divergent, meet the minimum standard of agreement required<sup>6</sup> in the case of the fifteen pairs for the one institution in Group A, and fifty-four of the fifty-eight pairs for the four institutions in Group C.

(9) The corrected coefficients for the traits correlated, although extremely variable, tend in general to be marked or high in the case of correlations between moral and intellectual traits, depending upon whether the intellectual trait correlated denotes abstract or social intelligence, and to be marked in the case of intercorrelations between intellectual traits, as shown by the tabulation on the following page.

(10) The qualitative weights assigned to the coefficients range from 4 to 2 according to the final grades assigned to the ratings, with 2 as the weight in all but one instance.

A critical examination of the corrected coefficients with reference to various factors which may affect the degree of relationship found, although limited in significance by the small number of

<sup>4</sup>The absence of high reliability coefficients for this institution, represented by 77 retained students, is presumably explained by the fact that the student judges in this case had less opportunity to become well acquainted with the members of the senior class who served as subjects than did the student judges in the other four institutions, in each of which the senior class was less than one-half as large.

<sup>5</sup>Five of the nine exceptional instances occur in the case of the institution placed last in the table, this location signifying that a lower composite score had been assigned to the ratings for this institution than to the ratings for any other institution in Group C.

<sup>6</sup>If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

		Corrected Coefficients	
		Weighted Mean or	
		Weighted Quartile Points <sup>b</sup>	
Traits Correlated	No. of Coeffi- cients <sup>a</sup>	Median or Mean <sup>c</sup>	Q <sub>1</sub> and Q <sub>3</sub>
Unselfishness ( <i>U</i> ), Loyalty to School and Friends ( <i>L</i> ), Justice to All ( <i>J</i> ), Courage in Support of Convictions ( <i>C</i> ), Self-Control ( <i>S</i> ), Activity for Social Welfare ( <i>A</i> ), and Reliability ( <i>R</i> ) with			
Intellect as Shown in Studies ( <i>IS</i> ) .....	25	.49	.27 ... .67
<i>U IS</i> .....	3	.37	
<i>L IS</i> .....	5	.44	
<i>J IS</i> .....	3	.57	
<i>C IS</i> .....	3	.57	
<i>S IS</i> .....	4	.80	
<i>A IS</i> .....	4	.56	
<i>R IS</i> .....	3	.47	
Unselfishness ( <i>U</i> ), Loyalty to School and Friends ( <i>L</i> ), Justice to All ( <i>J</i> ), Courage in Support of Convictions ( <i>C</i> ), Self-Control ( <i>S</i> ), Activity for Social Welfare ( <i>A</i> ), and Reliability ( <i>R</i> ) with			
Intellect as Shown in Activities Other than Studies ( <i>IA</i> ) .....	25	.73	.38 ... .86
<i>U IA</i> .....	4	.16	
<i>L IA</i> .....	4	.43	
<i>J IA</i> .....	4	.77	
<i>C IA</i> .....	3	.77	
<i>S IA</i> .....	4	.81	
<i>A IA</i> .....	4	.90	
<i>R IA</i> .....	2	*.64	
Intellect as Shown in Studies ( <i>IS</i> ) with			
Intellect as Shown in Activities Other than Studies ( <i>IA</i> ) .....	4	.52	-.09 ... +.76

<sup>a</sup> All italicized coefficients reported in Table XIV are excluded in this tabulation.

It will be observed that the figures in italics in the present tabulation

institutions represented, discloses further facts of interest, as follows:<sup>7</sup>

(1) A comparison of the coefficients for the one institution in Group A with the coefficients for the four institutions in Group C seems to indicate that the quality of the data has a definite effect upon the degree of relationship found, since the coefficients for the institution represented by the more satisfactory ratings are higher in twelve out of thirteen columns than the central tendency of the coefficients for the institutions represented by the less satisfactory ratings. Since the influence of this factor appeared to be exactly reverse in the case of the corresponding coefficients calculated from ratings by faculty judges presented in Table XIII, however, this finding may possibly be attributed to a combination of favorable circumstances or even to chance, particularly in view of the fact that this tendency is not discernible in the case of coefficients of intercorrelation between ratings in moral traits by student judges presented in Table XV.

(2) A comparison of the coefficients for the one institution represented by 40 or more students retained as subjects with the four institutions represented by fewer than 40 students retained as subjects results in the same finding with reference to size of senior class,<sup>8</sup> and presumably also with reference to size of institution, as

<sup>7</sup> Throughout this discussion italicized coefficients reported in Table XIV are disregarded because of the unsatisfactory character of the data from which they were derived.

The preferred measure of central tendency for the several comparisons offered is the simple median of the appropriate results, the mean being substituted if the number of coefficients concerned was only two, or a single coefficient being used if but one was available. It will be noted that comparisons for a number of columns were not possible because omitted or italicized coefficients were involved. The arrangement of the coefficients was in each case on a scale from +1.00 to -1.00.

<sup>8</sup> The fact that the phrase *number of students retained as subjects* may be used in the present connection as synonymous with the phrase *size of senior class* can be determined by reference to Table XI, in which it will be found that the institution represented by the largest number of students for whom ratings were requested is identical with the institution represented by the largest number of students retained as subjects, and that for the four other institutions the number of students retained as subjects is the same as the number of students for whom ratings were requested.

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represent totals for the results subsumed under them, the combined results representing, respectively, Ratings as to Abstract Intelligence and Ratings as to Social Intelligence.

<sup>b</sup> The method of weighting used in the tabulation is qualitative, the weight applied to each coefficient corresponding to the final grade assigned to the ratings by student judges for the institution in question.

<sup>c</sup> A weighted mean is distinguished from a weighted median by an asterisk.

that given in the preceding paragraph, since the grouping of the contrasted institutions is identical. The finding stated above, however, is to be contrasted with the finding of an indifferent effect for size of senior class in the case of the coefficients calculated from ratings by faculty judges referred to above.

(3) A comparison of the coefficients for the two institutions represented by an average number of ratings retained per student per trait above 12.00 with the three institutions represented by a similar average number of ratings below 9.00 seems to indicate that the number of judges combined with the extent of acquaintance with the students to be rated has a definite effect upon the degree of relationship found, since the coefficients for the institutions represented by the larger average number of ratings tend to be lower in nine columns and higher in five columns than the coefficients for the institutions represented by the smaller average number of ratings. Moreover, this apparent tendency toward a lower degree of relationship for a larger average number of ratings is in accord with a pronounced tendency in this direction found in the case of two similar comparisons for the coefficients calculated from ratings by faculty and student judges referred to above, a finding which is possibly due to the fact that an increase in the number of judges rating a given student may be expected to decrease the halo error.

(4) A comparison of the coefficients for the two exceptional institutions included in the table, namely, Institution 16, the one two-year college, which chances to be the only non-coeducational institution for women, and Institution 22, the one institution for students of a different race, which chances to be the only non-coeducational institution for men, with the central tendencies of the coefficients for the other three institutions represented is of interest principally because of the comparatively large number of negative coefficients obtained in the case of the junior college for young women and the institution for Negro students. However, since this tendency toward negative correlation persists for only one of these exceptional institutions in the case of the coefficients calculated from ratings in moral traits by student judges already cited, and is not borne out by the results for either of these institutions in the case of the coefficients calculated from ratings in moral and intellectual traits by faculty judges also cited above, it is possible that chance errors in the ratings are more potent than the factor under consideration. This suggestion appears the more probable because of the unsatisfactory character of the ratings involved, as shown by the large number of omitted or italicized coefficients for the two institutions under consideration.

(5) A consideration of the fact that most of the subjects in the investigation were college seniors presumably of good moral char-

acter suggests that, other things being equal, the degree of relationship found is doubtless considerably lower than the result to be expected without the restriction in range characteristic of the groups investigated.

(6) Lastly, a consideration of the general effect of the halo error suggests that, in spite of the factors which tend to reduce the size of the coefficients, and regardless of the large average number of ratings retained per student per trait in this instance, the values given in the table may still be somewhat high.

In summary, then, it may be said that coefficients of correlation between ratings in moral and intellectual traits by student judges point to a direct and marked or high relation between moral character and intelligence among college students in the United States. Nevertheless, this result is doubtless affected by various extraneous and selective factors which probably tend on the whole to raise the degree of relationship found.

### SECTION 3

#### COEFFICIENTS OF INTERCORRELATION BETWEEN RATINGS IN MORAL TRAITS BY STUDENT JUDGES

Table XV presents coefficients of intercorrelation between ratings in moral traits by student judges. Although this table does not afford any evidence as to the relation between moral and intellectual traits, it is nevertheless of interest, since the relationships reported are conceivably of as great importance from the standpoint of social policy as the relationship particularly investigated in this division of the research.

The table includes the key number of the institution for the five selected institutions represented, the final grade assigned to the ratings by student judges, the number of students retained as subjects in the investigation, the number of judges and the number of ratings retained in each of the nine traits, the average number of ratings retained per student per trait in the correlational analysis of the data, the alternate and the corrected coefficients calculated between ratings in moral traits for student judges, and the qualitative weight assigned to the coefficients for each institution in the compilation of correlational results.

TABLE XV  
COEFFICIENTS OF INTERCORRELATION BETWEEN RATINGS IN MORAL TRAITS BY STUDENT JUDGES<sup>a</sup>

KEY NO. OF INSTI- TUTION	FINAL GRADE ASSIGNED TO RATINGS	NO. OF STUDENTS RETAINED AS SUBJECTS	NO. OF JUDGES RETAINED										NO. OF RATINGS RETAINED										AV. NO. OF RATINGS RETAINED PER STUDENT PER TRAIT
			U	L	J	C	S	A	R	IS	IA	U	V	L	J	C	S	A	R	IS	IA		
9	A	77	37	37	35	35	35	35	33	31	30	747	744	718	718	701	678	616	550	537	8.67		
21	C	24	15	15	14	16	16	15	15	14	13	317	318	297	328	297	308	316	292	290	12.65		
16	C	17	16	16	16	16	16	16	16	16	16	261	261	261	261	261	260	260	260	261	15.31		
28 <sup>b</sup>	C	26	6	6	7	6	7	6	6	6	6	152	152	162	145	171	148	147	141	147	5.18 <sup>c</sup>		
22	C	32	9	8	8	8	8	7	7	7	7	272	250	250	250	250	216	215	213	212	7.39		

KEY NO. OF INSTI- TUTION	ALTERNATE COEFFICIENTS <sup>d</sup>																					
	U1L2	U2L1	U1J2	U2J1	U1C2	U2C1	U1S2	U2S1	U1A2	U2A1	U1R2	U2R1	L1J2	L2J1	L1C2	L2C1	L1S2	L2S1	L1A2	L2A1	L1R2	L2R1
9	.39	.20	.51	.47	.21	.26	.29	.19	.17	.08	.16	.34	.31	.34	.25	.21	.12	.20	.25	.25	.21	.21
21	.63	.27	.39	.24	.29	-.04	.09	.25	.63	-.08	.60	.18	.63	.57	.41	.29	.25	.50	.76	.38	.86	.51
16	.29	.68	.55	.71	-.02	.10	-.49	.14	.04	.18	.34	.78	.61	.35	-.06	.28	-.26	-.19	.24	.62	.44	.00
28																						
22	.45	.55	.81	.44	.24	.09	.78	.60	.56	.03	.71	.26	.66	.42	.32	.24	.68	.66	.56	.19	.65	.42



## ALTERNATE COEFFICIENTS (Concluded)

KEY NO. OF INSTI- TUTION	J1C2	J2C1	J1S2	J2S1	J1A2	J2A1	J1R2	J2R1	C1S2	C2S1	C1A2	C2A1	C1R2	C2R1	S1A2	S2A1	S1R2	S2R1	A1R2	A2R1
9	.34	.34	.22	.32	.21	.28	.21	.38	.23	.39	.26	.24	.14	.33	.44	.21	.13	.22	.14	.18
21	.42	.17	.24	.51	.63	.23	.73	.39	-.07	.35	.21	.08	.16	.30	.45	.10	.54	.25	.47	.47
16	.01	.22	-.36	-.01	.03	.27	.44	-.07	-.38	.31	.38	.31	-.13	.48	-.60	-.30	.08	-.08	-.19	.10
28	.37	.24	.52	.46	.45	.37	.48	.45	.50	.44	.43	.28	.43	.14	.38	.51	.45	.31	.51	.32
22	.25	.47	.63	.61	.38	.10	.52	.30	.33	.41	.17	.27	.29	.33	.58	.07	.56	.34	.12	.13

CORRECTED COEFFICIENTS<sup>a</sup>

KEY NO. OF INSTI- TUTION	U L	U J	U C	U S	U A	U R	L J	L C	L S	L A	L R	J C	J S	J A	J R	C S	C A	C R	S A	S R	A R	QUALITATIVE WEIGHT ASSIGNED TO COEFFICIENTS
9	.73	.97	.47	.59	.26	...	.92	.65	.54	.79	...	.74	.72	.58	...	.82	.61	...	.91	...	...	4
21	.81	.78	...	.45	.59	.74	.96	...	.65	.74	.94	...	.84	.68	.99	...	...	...	.44	.78	.74	2
16	.65	1.16	.06	-.31	.13	.92	.87	.15	-.39	.58	.90	.09	-.14	.18	1.10	-.28	.50	.30	-.77	.00	-.08	2
28	...	...	...	...	...	...	.97	.74	.79	.93	.79	.77	.99	.78	.89	1.07	.75	.52	.75	.64	.65	2
22	1.04	.91	...	.94	...	.87	1.21	...	1.39	...	1.53	...	.93	...	.87	...	...	...	...	.87	...	2

## KEY TO SYMBOLS

U Unselfishness. L Loyalty to School and Friends. J Justice to All. C Courage in Support of Convictions. S Self-Control. A Activity for Social Welfare.  
R Reliability. IS Intellect as Shown in Studies. IA Intellect as Shown in Activities Other than Studies.  
Subscript 1 First Half of Data. Subscript 2 Second Half of Data.

<sup>a</sup> Coefficients of intercorrelation between ratings in moral traits by student judges corresponding to the coefficients presented in this table are included among correlational results obtained for non-selected institutions as presented in Appendix II, Section 3, C. It will be observed that, in spite of the relatively unsatisfactory quality of the data involved, two-thirds of the 66 alternate or raw coefficients reported therein confirm the evidence afforded by the coefficients reported above of a direct relation between moral traits.

<sup>b</sup> The uniform omission of the trait *Usefulness* in the results reported for Institution 28 is due to the comparatively small number of ratings assigned in that trait as a result of unsatisfactory manifold.

<sup>c</sup> This figure is calculated on the basis of nine traits, as in the case of the other institutions for which results are reported in the table.

<sup>d</sup> Alternate coefficients which correspond to omitted or italicized corrected coefficients, and likewise italicized corrected coefficients, are disregarded in subsequent discussion because the data involved failed to meet the requirements as to reliability and consistency formulated in the course of the investigation (cf. Appendix II, Section 2).

<sup>e</sup> The reliability coefficients utilized in calculating corrected coefficients, reported as usual to two places only, may be ascertained by consulting the appropriate entries for the institutions in question in Table XIV.

The traits correlated in this series of coefficients for ratings by student judges are given below :

Unselfishness (*U*) with

Loyalty to School and Friends (*L*), Justice to All (*J*), Courage in Support of Convictions (*C*), Self-Control (*S*), Activity for Social Welfare (*A*), and Reliability (*R*).

Loyalty to School and Friends (*L*) with

Justice to All (*J*), Courage in Support of Convictions (*C*), Self-Control (*S*), Activity for Social Welfare (*A*), and Reliability (*R*).

Justice to All (*J*) with

Courage in Support of Convictions (*C*), Self-Control (*S*), Activity for Social Welfare (*A*), and Reliability (*R*).

Courage in Support of Convictions (*C*) with

Self-Control (*S*), Activity for Social Welfare (*A*), and Reliability (*R*).

Self-Control (*S*) with

Activity for Social Welfare (*A*) and Reliability (*R*).

Activity for Social Welfare (*A*) with

Reliability (*R*).

All of the resulting coefficients are of significance in a consideration of the relation between moral traits.

The coefficients of intercorrelation between ratings in moral traits by student judges presented in Table XV afford practically consistent evidence of a positive correlation between various aspects of morality.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There are five institutions represented in the coefficients calculated from ratings by student judges.

(2) The final grades assigned to the ratings range from A to C, with C as the grade in all but one instance.

(3) The number of students retained as subjects ranges from 77 to 17, with 26 as the median number, and with 176 as the total number of students retained.

(4) The number of judges retained in the several traits ranges from 6 to 37, with 16 as the most frequent number.

(5) The number of ratings retained in the several traits ranges from 747 to 141, with 200-299 as the most frequent interval.

(6) The average number of ratings retained per student per trait varies from 15.31 to 5.18, with 8.67 as the median number.

(7) The alternate coefficients for the traits correlated, although at times widely divergent, meet the minimum standard of agreement required<sup>9</sup> in the case of the twenty-one pairs for the one institution in Group A, and seventy-one of the seventy-eight pairs for the four institutions in Group C.

(8) The corrected coefficients for the traits correlated, although extremely variable, tend in general to be high in the case of all but two of the seven moral traits correlated, and to be marked in the remaining instances, and to be almost consistently high for three of the seven traits, as shown by the tabulation on the following pages.

(9) The qualitative weights assigned to the coefficients range from 4 to 2 according to the final grades assigned to the ratings, with 2 as the weight in all but one instance.

A critical examination of the corrected coefficients with reference to various factors which may affect the degree of relationship found, although limited in significance by the small number of institutions represented, discloses further facts of interest, as follows:<sup>10</sup>

(1) A comparison of the coefficients for the one institution in Group A with the coefficients for the four institutions in Group C seems to indicate that the quality of the data has an indifferent effect upon the degree of relationship found, since the coefficients for the institution represented by the more satisfactory ratings are lower in eight columns and higher in seven columns than the central tendency of the coefficients for the institutions represented by the less satisfactory ratings. However, this finding is not in accord with the finding of a similar comparison for coefficients of correlation between ratings in moral and intellectual traits by student judges presented in Table XIV, nor in accord with the contradictory finding of another similar comparison for the corresponding coefficients for ratings by faculty judges presented in Table XIII.

(2) A comparison of the coefficients for the one institution rep-

<sup>9</sup> If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

<sup>10</sup> Throughout this discussion italicized coefficients reported in Table XV are disregarded because of the unsatisfactory character of the data from which they were derived.

The preferred measure of central tendency for the several comparisons offered is the simple median of the appropriate results, the mean being substituted if the number of coefficients concerned was only two, or a single coefficient being used if but one was available. It will be noted that comparisons for a number of columns were not possible because omitted or italicized coefficients were involved. The arrangement of the coefficients was in each case on a scale from +1.00 to -1.00.

Traits Correlated <sup>a</sup>	No. of Coeffi- cients <sup>b</sup>	Corrected Coefficients Weighted Quartile Points <sup>c</sup>		
		Median	Q <sub>1</sub>	and Q <sub>3</sub>
Unselfishness ( <i>U</i> ) with Loyalty to School and Friends ( <i>L</i> ), Justice to All ( <i>J</i> ), Courage in Support of Convictions ( <i>C</i> ), Self- Control ( <i>S</i> ), Activity for Social Welfare ( <i>A</i> ), and Reliability ( <i>R</i> ) . . . . .	14	.70	.46	. . . . . .93
Loyalty to School and Friends ( <i>L</i> ) with Unselfishness ( <i>U</i> ), Justice to All ( <i>J</i> ), Courage in Sup- port of Convictions ( <i>C</i> ), Self-Control ( <i>S</i> ), Activity for Social Welfare ( <i>A</i> ), and Reliability ( <i>R</i> ) . . . . .	23	.77	.67	. . . . . .92
Justice to All ( <i>J</i> ) with Unselfishness ( <i>U</i> ), Loyalty to School and Friends ( <i>L</i> ), Courage in Support of Convictions ( <i>C</i> ), Self-Con- trol ( <i>S</i> ), Activity for So- cial Welfare ( <i>A</i> ), and Re- liability ( <i>R</i> ) . . . . .	19	.88	.71	. . . . . .96
Courage in Support of Convic- tions ( <i>C</i> ) with Unselfishness ( <i>U</i> ), Loyalty to School and Friends ( <i>L</i> ), Justice to All ( <i>J</i> ), Self- Control ( <i>S</i> ), Activity for Social Welfare ( <i>A</i> ), and Reliability ( <i>R</i> ) . . . . .	13	.62	.46	. . . . . .73
Self-Control ( <i>S</i> ) with Unselfishness ( <i>U</i> ), Loyalty to School and Friends ( <i>L</i> ), Justice to All ( <i>J</i> ), Courage in Support of Convictions ( <i>C</i> ), Activity for Social Welfare ( <i>A</i> ), and Reli- ability ( <i>R</i> ) . . . . .	21	.74	.53	. . . . . .90

<sup>a</sup> It will be observed that all of the intercorrelations for each trait are indicated regardless of duplications, and that the results given in the tabulation are consistent with this plan.

Traits Correlated <sup>a</sup>	No. of Coeffi- cients <sup>b</sup>	Corrected Coefficients <i>Weighted Quartile Points</i> <sup>c</sup>		
		<i>Median</i>	<i>Q<sub>1</sub> and Q<sub>3</sub></i>	
Activity for Social Welfare (A) with Unselfishness (U), Loyalty to School and Friends (L), Justice to All (J), Courage in Support of Convictions (C), Self-Control (S), and Reliability (R) . . . . .	20	.63	.41	.76
Reliability (R) with Unselfishness (U), Loyalty to School and Friends (L), Justice to All (J), Courage in Support of Convictions (C), Self-Control (S), and Activity for Social Wel- fare (A) . . . . .	16	.77	.64	.90

<sup>b</sup> All italicized coefficients reported in Table XV are excluded in this tabulation.

<sup>c</sup> The method of weighting used in the tabulation is qualitative, the weight applied to each coefficient corresponding to the final grade assigned to the ratings by student judges for the institution in question.

resented by 40 or more students retained as subjects with the four institutions represented by fewer than 40 students retained as subjects results in the same finding with reference to size of senior class,<sup>11</sup> and presumably also with reference to size of institution, as that given in the preceding paragraph, since the grouping of the contrasted institutions is identical. The finding stated above, moreover, is in general accord with the finding of an indifferent effect for size of senior class in the case of the coefficients calculated from ratings by faculty judges referred to above.

(3) A comparison of the coefficients for the two institutions represented by an average number of ratings retained per student per trait above 12.00 with the three institutions represented by a similar average number of ratings below 9.00 seems to indicate that the number of judges combined with the extent of acquaintance with the students to be rated has a definite effect upon the degree of

<sup>11</sup> The fact that the phrase *number of students retained as subjects* may be used in the present connection as synonymous with the phrase *size of senior class* can be determined by reference to Table XI, in which it will be found that the institution represented by the largest number of students for whom ratings were requested is identical with the institution represented by the largest number of students retained as subjects, and that for the four other institutions the number of students retained as subjects is the same as the number of students for whom ratings were requested.

relationship found, since the coefficients for the institutions represented by the larger average number of ratings tend to be lower in fourteen columns and higher in three columns than the coefficients for the institutions represented by the smaller average number of ratings. Moreover, this finding is partially confirmed by a similar comparison for the coefficients calculated from ratings by student judges referred to above, and is strongly supported by the finding of a similar comparison for the coefficients calculated from ratings by faculty judges also referred to, the tendency noted being possibly attributable to the fact that an increase in the number of judges rating a given student may be expected to decrease the halo error.

(4) A comparison of the coefficients for the two exceptional institutions included in the table, namely, Institution 16, the one two-year college, which chances to be the only non-coeducational institution for women, and Institution 22, the one institution for students of a different race, which chances to be the only non-coeducational institution for men, with the central tendencies of the coefficients for the other three institutions represented is of interest principally because of the unusually large number of negative coefficients obtained in the case of the junior college for young women, and the exceedingly high coefficients obtained in the case of the institution for Negro students. However, although this tendency toward negative correlation was also noted for the first of these two institutions in the case of the coefficients calculated from ratings in moral and intellectual traits by student judges already cited, it is not to be observed in the corresponding coefficients for faculty judges also cited above; at the same time, although the finding of a high positive correlation for the second of these two institutions finds support in the series of results for faculty judges referred to, it is to be contrasted with an extreme tendency toward negative correlation in the case of the other series of results for student judges to which reference is made. Hence it is probable that chance errors or the halo error are more potent than the factor under consideration, particularly in view of the unsatisfactory character of the ratings involved, as shown by the large number of omitted or italicized coefficients for the two institutions under consideration.

(5) A consideration of the fact that most of the subjects in the investigation were college seniors presumably of good moral character suggests that, other things being equal, the degree of relationship found is doubtless considerably lower than the result to be expected without the restriction in range characteristic of the groups investigated.

(6) Lastly, a consideration of the general effect of the halo error, and its particular effect in a situation in which the traits designated for rating are of the same general type, strongly suggests that, in spite of the factors which tend to reduce the size of the coefficients, and regardless of the large average number of rat-

ings retained per student per trait in this instance, the values given in the table may be generally far too much alike and illusively high.

In summary, then, it may be said that coefficients of inter-correlation between ratings in moral traits by student judges point to a direct and marked or high relation between various aspects of morality among college students in the United States. Nevertheless, this result is doubtless affected by various extraneous and selective factors which almost certainly tend on the whole to raise the degree of relationship found.

#### SECTION 4

##### COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS AND COMPOSITES OF RATINGS IN MORAL AND INTELLECTUAL TRAITS

Table XVI presents coefficients of correlation between ratings in moral and intellectual traits and composites of ratings in moral and intellectual traits. This table is of interest because it affords additional evidence as to the relation between moral and intellectual traits.

The table has two major divisions, which serve to differentiate the various coefficients according to the type of judges submitting ratings. These major divisions are designated as follows:

- A. Calculated from Ratings by Faculty Judges.
- B. Calculated from Ratings by Student Judges.

These two divisions of the table include the key number of the institution for the five selected institutions represented by the two types of judges, the final grade assigned to the ratings by faculty or by student judges, the number of students retained as subjects in the investigation, the principal reliability coefficients for the single and the combined traits correlated with their probable errors, the alternate and the corrected coefficients calculated between ratings in moral and intellectual traits and composites of ratings in moral and intellectual traits, and the qualitative weight assigned to the coefficients for each institution in the compilation of correlational results.

TABLE XVI  
COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS  
AND COMPOSITES OF RATINGS IN MORAL AND INTELLECTUAL TRAITS  
A. Calculated from Ratings by Faculty Judges

KEY NO. OF INSTI- TUTION	FINAL GRADE ASSIGNED TO RATINGS	NO. OF STUDENTS RETAINED AS SUBJECTS	RELIABILITY COEFFICIENTS WITH PROBABLE ERRORS		ALTERNATE COEFFICIENTS		CORRECTED COEFFICIENT	QUALITATIVE WEIGHT ASSIGNED TO COEFFICIENTS
			MM <sub>2</sub>	IS-IA1S-IA <sub>2</sub>	M1S-IA <sub>2</sub>	M2S-IA1		
22	B	32	.48 ± .10	.85 ± .03	.45	.36	.63	3
28	C	26	.55 ± .10	.59 ± .09	.15	.19	.29	2
16	C	17	.82 ± .06	.82 ± .06	.48	.61	.65	2
21	C	24	.85 ± .04	.75 ± .07	.64	.19	.43	2
9	D	45	.33 ± .09	.49 ± .08	.20	.20	.49	1

B. Calculated from Ratings by Student Judges

KEY NO. OF INSTI- TUTION	FINAL GRADE ASSIGNED TO RATINGS	No. of STUDENTS RETAINED AS SUBJECTS	RELIABILITY COEFFICIENTS <sup>a</sup> WITH PROBABLE ERRORS		ALTERNATE COEFFICIENTS <sup>b</sup>						CORRECTED COEFFICIENTS <sup>b</sup>			QUALITATIVE WEIGHT ASSIGNED TO COEFFICIENTS
			U-R1U-R <sub>2</sub>	IS-IA1S-IA <sub>2</sub>	U-R1S-IA <sub>2</sub>	U-R2S-IA <sub>1</sub>	U-R1S1	U-R2S1	U-R1A <sub>2</sub>	U-R2IA <sub>1</sub>	U-R IS-IA	U-R IS		
												U-R 1A	U-R 1A	
9	A	77	.53±.06	.42±.07	.47	.31	.39	.31	.36	.21	.82	.70	.78	4
21	C	24	.59±.10	.52±.11	.79	.23	.54	-.16	.70	.45	.77	.39	.88	2
16	C	17	.68±.10	.67±.11	.07	.57	.16	.61	-.18	.21	.30	.41	.03	2
28	C	26	.64±.08	.86±.04	.64	.55	.68	.42	.34	.56	.80	.72	.67	2
22	C	32	.75±.06	.58±.08	.10	-.13	.02	-.15	.18	-.06	-.02	-.08	.14	2

KEY TO SYMBOLS

**M** Morality in the Broadest Sense. **IS-IA** Composite of Intellectual Traits. **U-R** Composite of Moral Traits. **IS** Intellect as Shown in Studies. **IA** Intellect as Shown in Activities Other than Studies. **Subscript 1** First Half of Data. **Subscript 2** Second Half of Data.

<sup>a</sup> The reliability coefficients for single traits utilized in calculating corrected coefficients, reported as usual to two places only, may be ascertained by consulting the appropriate entries for the institutions in question in Table XIV.

<sup>b</sup> Alternate coefficients which correspond to italicized corrected coefficients, and likewise italicized consistency coefficients formulated in the course of the investigation (cf. Appendix II, Section 2).



The traits correlated in this series of coefficients for ratings by the two types of judges are given below:

RATINGS BY FACULTY JUDGES

Morality in the Broadest Sense (*M*) with  
Composite of Intellectual Traits (*IS-IA*).

RATINGS BY STUDENT JUDGES

Composite of Moral Traits (*U-R*) with  
Composite of Intellectual Traits (*IS-IA*), Intellect as Shown in  
Studies (*IS*), and Intellect as Shown in Activities Other than  
Studies (*IA*).

All of the resulting coefficients are of significance in a consideration of the relation between moral and intellectual traits.

The coefficients of correlation between ratings in moral and intellectual traits and composites of ratings in moral and intellectual traits presented in Table XVI afford fairly consistent evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There are five institutions represented in the coefficients calculated from ratings by faculty judges, and likewise in the coefficients calculated from ratings by student judges.

(2) The final grades assigned to the ratings range from B to D in the case of ratings by faculty judges and from A to C in the case of ratings by student judges, with C as the most frequent grade in both instances.

(3) The number of students retained as subjects ranges from 45 to 17 in the case of ratings by faculty judges and from 77 to 17 in the case of ratings by student judges, with 26 as the median number in both instances, and with 144 and 176, respectively, as the total numbers of students retained in the two instances.

(4) The reliability coefficients for the single and the combined traits are high or marked with one exception in the case of ratings by faculty judges, and high or marked without exception in the case of ratings by student judges; moreover, the reliability coefficients are more than five times their probable errors in all but two instances in the case of ratings by faculty judges and in all but one instance in the case of ratings by student judges. At the same time, notwithstanding the assumed greater objectivity of the ratings in the two intellectual traits, the reliability coefficient for the single moral trait is higher than the corresponding reliability coefficient for the two intellectual traits combined for one of the five institu-

tions and equal to it in an additional instance in the case of ratings by faculty judges; whereas the reliability coefficients for the seven moral traits combined are higher than the corresponding reliability coefficients for the two intellectual traits combined for four of the five institutions in the case of ratings by student judges, the larger number of moral traits doubtless being a factor in the situation found.

(5) The alternate coefficients for the traits correlated, although at times widely divergent, meet the minimum standard of agreement required<sup>12</sup> in the case of the five pairs calculated from ratings by faculty judges, and thirteen of the fifteen pairs calculated from ratings by student judges, for the five institutions concerned.

(6) The corrected coefficients for the traits correlated, although somewhat variable in the first case and extremely variable in the second case, tend in general to be marked in the case of ratings by faculty judges, and to be high in the case of ratings by student judges, as the following tabulation shows:

Traits Correlated	No. of Coeffi- cients <sup>a</sup>	Corrected Coefficients <i>Weighted Median<sup>b</sup></i>
A. CALCULATED FROM RATINGS BY FACULTY JUDGES		
Morality in the Broadest Sense ( <i>M</i> ) with		
Composite of Intellectual Traits ( <i>IS-IA</i> ) .	5	.54
B. CALCULATED FROM RATINGS BY STUDENT JUDGES		
Composite of Moral Traits ( <i>U-R</i> ) with		
Composite of Intellectual Traits ( <i>IS-IA</i> ) .	4	.80
Composite of Moral Traits ( <i>U-R</i> ) with		
Intellect as Shown in Studies ( <i>IS</i> ) . . . . .	4	.70
Composite of Moral Traits ( <i>U-R</i> ) with		
Intellect as Shown in Activities Other than		
Studies ( <i>IA</i> ) . . . . .	5	.72

<sup>a</sup> All italicized coefficients reported in Table XVI are excluded in this tabulation.

<sup>b</sup> The method of weighting used in the tabulation is qualitative, the weight applied to each coefficient corresponding to the final grade assigned to the ratings by faculty or student judges for the institution in question.

(7) The qualitative weights assigned to the coefficients range from 3 to 1 in the case of ratings by faculty judges, and from 4 to 2 in the case of ratings by student judges, according to the final

<sup>12</sup> If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

grades assigned to the ratings, with 2 as the most frequent weight in both instances.

In summary, then, it may be said that coefficients of correlation between ratings in moral and intellectual traits and composites of ratings in moral and intellectual traits point to a direct and marked or high relation between moral character and intelligence among college students in the United States. It should be added, however, that this result is doubtless affected by the same extraneous and selective factors that were analyzed in the preceding sections as probably tending on the whole to raise the degree of relationship found.

## SECTION 5

### COEFFICIENTS OF CROSS-CORRELATION BETWEEN RATINGS BY FACULTY JUDGES AND RATINGS BY STUDENT JUDGES

Table XVII presents coefficients of cross-correlation between ratings by faculty judges and ratings by student judges. This table is of interest because it permits a comparison between the ratings by faculty judges and the ratings by student judges, and hence provides a means of checking the consistency of the ratings by both faculty and student judges, and the stability of the relationships between moral and intellectual traits previously found in the ratings by each type of judge.

The table has two major divisions, which serve to differentiate the various coefficients according to the type of traits represented by the ratings. These major divisions are designated as follows:

- A. Calculated from Ratings in Analogous or Identical Traits.
- B. Calculated from Ratings in Contrasting Traits.

These two divisions of the table include the key number of the institution for the five selected institutions represented by the ratings in the two types of traits, the number of students retained as subjects in the investigation, and the alternate and the corrected coefficients calculated between ratings by faculty judges and ratings by student judges.

The traits correlated in this series of coefficients for ratings in the two types of traits follow :

TABLE XVII  
COEFFICIENTS OF CROSS-CORRELATION BETWEEN RATINGS BY FACULTY JUDGES AND RATINGS  
BY STUDENT JUDGES  
A. Calculated from Ratings in Analogous or Identical Traits

KEY NO. OF INSTI- TUTION	NO. OF STUDENTS RETAINED AS SUBJECTS	ALTERNATE COEFFICIENTS <sup>a</sup>								CORRECTED COEFFICIENTS <sup>a, b</sup>			
		MFU-RS	MFU-RIS	ISFIS	ISFIS	IAFIS	IAFIS	IS-IAFIS-IAIS	IS-IAFIS-IAIS	MF U-RS	ISF IS	IAF IAS	IS-IAF IS-IAIS
9	45	.06	.44	.33	.33	.52	.24	.44	.31	.39	.61	1.47	.82
22	32	.23	.29	.70	.85	.13	.73	.51	.90	.43	1.01	.75	.96
28	26	.62	.78	.52	.52	.54	.59	.80	.80	.10	1.10	.77	.97
21	24	.12	.04	.38	.38	.61	.61	.47	.37	.10	.67	.89	.67
16	17	.67	.36	.70	.65	.96	-.92	.55	.52	.66	.81	.04	.72

B. Calculated from Ratings in Contrasting Traits

KEY NO. OF INSTI- TUTION	NO. OF STUDENTS RETAINED AS SUBJECTS	ALTERNATE COEFFICIENTS <sup>a</sup>								CORRECTED COEFFICIENTS <sup>a, b</sup>			
		MFIS-IAIS	MFIS-IAIF	U-RISIS-IAIF	U-RISIS-IAIF	U-RISIS-IAIF	U-RISIS-IAIF	U-RISIS-IAIF	U-RISIS-IAIF	MF IS-IAIS	U-RS IS-IAF	U-RS ISF	U-RS IAF
9	45	.02	.39	.29	.04	.59	.61	.57	.57	.24	.22		
22	32	.51	.59	-.29	-.29	.69	.59	.61	.57	1.04	-.24		
28	26	.01	.48	.71	.61	.69	.59	.61	.57	.10	1.07	1.02	.99
21	24	.24	.09	.22	.20	.20	.38	.03	.65	.23	.32	.34	.23
16	17	.15	.20	.14	.66	.17	.38	.03	.65	.23	.40		

KEY TO SYMBOLS

**M** Morality in the Broadest Sense. **U-R** Composite of Moral Traits. **IS** Intellect as Shown in Studies. **IA** Intellect as Shown in Activities Other than Studies.  
**Subscript 1** First Half of Data. **Subscript 2** Second Half of Data. **IS-IA** Composite of Intellectual Traits. **Subscript S** Ratings by Student Judges.  
 failed to meet the requirements as to reliability and consistency corrected coefficients, and likewise italicized corrected coefficients, are disregarded in subsequent discussion because the data involved  
 b The reliability coefficients utilized in calculating corrected coefficients, reported as usual to two places only, may be ascertained by consulting the appropriate entries for the institutions in question in Tables XIII and XVI in the case of ratings by faculty judges, and in Tables XIV and XVI in the case of ratings by student judges. It will be observed that the number of students retained as subjects in the calculation of these reliability coefficients corresponds to the number retained as subjects in the calculation of the coefficients reported above for the same institutions, with the following exception: Institution 9, represented by a group of 77 students in the tables referred to in the case of ratings by student judges.

## RATINGS IN ANALOGOUS OR IDENTICAL TRAITS

Morality in the Broadest Sense—Ratings by Faculty Judges ( $M_F$ ) with

Composite of Moral Traits—Ratings by Student Judges ( $U-R_s$ ).

Intellect as Shown in Studies—Ratings by Faculty Judges ( $IS_F$ ) with

Intellect as Shown in Studies—Ratings by Student Judges ( $IS_s$ ).

Intellect as Shown in Activities Other than Studies—Ratings by Faculty Judges ( $IA_F$ ) with

Intellect as Shown in Activities Other than Studies—Ratings by Student Judges ( $IA_s$ ).

Composite of Intellectual Traits—Ratings by Faculty Judges ( $IS-IA_F$ ) with

Composite of Intellectual Traits—Ratings by Student Judges ( $IS-IA_s$ ).

## RATINGS IN CONTRASTING TRAITS

Morality in the Broadest Sense—Ratings by Faculty Judges ( $M_F$ ) with

Composite of Intellectual Traits—Ratings by Student Judges ( $IS-IA_s$ ).

Composite of Moral Traits—Ratings by Student Judges ( $U-R_s$ ) with

Composite of Intellectual Traits—Ratings by Faculty Judges ( $IS-IA_F$ ), Intellect as Shown in Studies—Ratings by Faculty Judges ( $IS_F$ ), and Intellect as Shown in Activities Other than Studies—Ratings by Faculty Judges ( $IA_F$ ).

Of the resulting coefficients, all in the case of ratings in analogous or identical traits are of significance in a consideration of the consistency of the ratings by both faculty and student judges, and all in the case of ratings in contrasting traits are of significance in a consideration of the stability of the relationships previously found in the case of the ratings by each type of judge.

The coefficients of cross-correlation between ratings by faculty judges and ratings by student judges presented in Table XVII with one exception show a positive correlation between ratings by the two types of judges.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There are five institutions represented in the coefficients calculated from ratings in analogous or identical traits, and likewise in the coefficients calculated from ratings in contrasting traits.

(2) The number of students retained as subjects for each institution, both in the case of ratings in analogous or identical traits

Traits Correlated	No. of Coeffi- cients <sup>a</sup>	Corrected Coefficients Single Coefficient or Weighted Median or Mean <sup>bo</sup>
A. CALCULATED FROM RATINGS IN ANALOGOUS OR IDENTICAL TRAITS		
Morality in the Broadest Sense—Ratings by Faculty Judges ( $M_F$ ) with Composite of Moral Traits—Ratings by Student Judges ( $U-R_s$ ) .....	4	.43
Intellect as Shown in Studies—Ratings by Faculty Judges ( $IS_F$ ) with Intellect as Shown in Studies—Ratings by Student Judges ( $IS_s$ ) .....	5	.80
Intellect as Shown in Activities Other than Studies—Ratings by Faculty Judges ( $IA_F$ ) with Intellect as Shown in Activities Other than Studies—Ratings by Student Judges ( $IA_s$ ) .....	2	*.88
Composite of Intellectual Traits—Ratings by Faculty Judges ( $IS-IA_F$ ) with Composite of Intellectual Traits—Ratings by Student Judges ( $IS-IA_s$ ) .....	4	.81
B. CALCULATED FROM RATINGS IN CONTRASTING TRAITS		
Morality in the Broadest Sense—Ratings by Faculty Judges ( $M_F$ ) with Composite of Intellectual Traits—Ratings by Student Judges ( $IS-IA_s$ ) .....	4	.22
Composite of Moral Traits—Ratings by Stu- dent Judges ( $U-R_s$ ) with Composite of Intellectual Traits—Ratings by Faculty Judges ( $IS-IA_F$ ) .....	5	.24
Composite of Moral Traits—Ratings by Stu- dent Judges ( $U-R_s$ ) with Intellect as Shown in Studies—Ratings by Faculty Judges ( $IS_F$ ) .....	2	*.75
Composite of Moral Traits—Ratings by Stu- dent Judges ( $U-R_s$ ) with Intellect as Shown in Activities Other than Studies—Ratings by Faculty Judges ( $IA_F$ ) .....	1	.99

<sup>a</sup> All italicized coefficients reported in Table XVII are excluded in this tabulation. [Footnotes to tabulation continued on page 291.]

and in the case of ratings in contrasting traits, is the same as the number retained as subjects for the corresponding institution in coefficients of correlation between ratings in moral and intellectual traits and composites of ratings in moral and intellectual traits calculated from ratings by faculty judges, as given in Table XVI, resulting in 144 as the total number of students retained for all institutions in the two instances.

(3) The alternate coefficients for the traits correlated, although at times widely divergent, meet the minimum standard of agreement required<sup>13</sup> in the case of seventeen of the twenty pairs calculated from ratings in analogous or identical traits and twelve of the fourteen pairs calculated from ratings in contrasting traits, for the five institutions concerned.

(4) The corrected coefficients for the traits correlated, although extremely variable, tend in general to be marked for correlations between moral traits and high for correlations between intellectual traits in the case of ratings in analogous or identical traits, and to be low for correlations between moral traits and combined intellectual traits and high for correlations between moral traits and single intellectual traits in the case of ratings in contrasting traits, as shown by the tabulation on the opposite page.

A cross-comparison of the corrected coefficients for ratings in moral traits by faculty or student judges correlated with ratings in intellectual traits by the same type of judge, reported in Table XVI, and the corresponding corrected coefficients for ratings in moral traits by faculty or student judges correlated with ratings in intellectual traits by a different type of judge, reported in Table XVII, affords the following information as to the effect of a different set of judges rating in the correlated traits upon the relation between moral character and intelligence found in the investigation:<sup>14</sup>

<sup>13</sup> If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

<sup>14</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from +1.00 to -1.00 was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed, italicized coefficients reported in Tables XVI and XVII, however, being disregarded because of the unsatisfactory character of the data from which they were derived. The simple median of these differences is the figure reported.

<sup>b</sup> The method of weighting used in the tabulation is quantitative, the weight applied to each coefficient corresponding to the number of students retained as subjects for the institution in question.

<sup>c</sup> A weighted mean is distinguished from a weighted median by an asterisk.

(1) In the case of ratings in a single moral trait by faculty judges, a change from faculty to student judges in the correlated series of ratings in intellectual traits apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.195$ , the second of these coefficients being lower than the first for three of the four institutions represented in the comparison.<sup>15</sup>

(2) In the case of ratings in seven moral traits combined by student judges, a change from student to faculty judges in the correlated series of ratings in intellectual traits apparently tends to be accompanied by an appreciable increase in the degree of relationship, since the median difference between the contrasted coefficients is  $+.10$ , the second of these coefficients being higher than the first for two of the four institutions represented in the comparison for the two intellectual traits combined, for one of the two institutions represented in the comparison for the single intellectual trait denoting abstract intelligence, and for the one institution represented in the comparison for the single intellectual trait denoting social intelligence.<sup>16</sup>

It is of interest to note that the finding of a lower degree of relationship between moral and intellectual traits in the case of ratings in a single moral trait by faculty judges when ratings in intellectual traits by the same type of judge are replaced by ratings in intellectual traits by a different type of judge is in accord with the result to be expected in view of the assumed effect of the halo error upon the correlation between ratings in moral and intellectual traits with the same set of judges rating in both moral character and intelligence. At the same time, it is evident that a contrary finding with no apparent explanation in the case

<sup>15</sup> The corrected coefficients involved in the comparison for ratings in a single moral trait by faculty judges in the order in which they are used in the discussion are (1) the coefficients calculated between Morality in the Broadest Sense and Composite of Intellectual Traits ( $M_{IS-IA}$ ), reported in Table XVI, and (2) the coefficients calculated between Morality in the Broadest Sense—Ratings by Faculty Judges and Composite of Intellectual Traits—Ratings by Student Judges ( $M_F IS-IA_S$ ), reported in Table XVII.

<sup>16</sup> The corrected coefficients involved in the comparison for ratings in seven moral traits combined by student judges in the order in which they are used in the discussion are (1) the coefficients calculated between Composite of Moral Traits and Composite of Intellectual Traits, Intellect as Shown in Studies, and Intellect as Shown in Activities Other than Studies ( $U-R IS-IA$ ,  $U-R IS$ , and  $U-R IA$ ), reported in Table XVI, and (2) the coefficients calculated between Composite of Moral Traits—Ratings by Student Judges and Composite of Intellectual Traits—Ratings by Faculty Judges, Intellect as Shown in Studies—Ratings by Faculty Judges, and Intellect as Shown in Activities Other than Studies—Ratings by Faculty Judges ( $U-R_S IS-IA_F$ ,  $U-R_S IS_F$ , and  $U-R_S IA_F$ ), reported in Table XVII.



of ratings in seven moral traits combined by student judges with a similar replacement in the correlated series of ratings raises a question as to the significance of this finding.<sup>17</sup>

In summary, then, it may be said that coefficients of cross-correlation between ratings by faculty judges and ratings by student judges point, in the first place, to the fact that ratings in moral traits by faculty and student judges for college students in the United States are often in disagreement, whereas ratings in intellectual traits by the two types of judges for these subjects customarily show close correspondence; in the second place, to the fact that, with a different set of judges rating in the correlated traits, correlations between moral traits and combined intellectual traits for the type of group investigated tend to be low and correlations between moral traits and single intellectual traits for these subjects tend to be high; and, in the third place, to the fact that ratings by faculty judges correlated with ratings by student judges, or ratings by student judges correlated with ratings by faculty judges, for the type of group investigated may show either a lower or a higher degree of relationship between moral and intellectual traits or their composites than do ratings by either type of judge correlated with each other, in spite of the fact that a lower rather than a higher degree of relationship would normally be expected in every case with the influence of the halo error eliminated. Since the results of the comparison between the ratings by the two types of judges are ambiguous, however, and since the utilization in the calculations of composites as well as single traits complicates the issue, the differences between the coefficients must be attributed to a combination of factors rather than to any one factor, although the effect of the halo error upon ratings by a single type of judge may conceivably be one of the most important factors affecting the comparison.

<sup>17</sup> It will be recalled that further proof of the influence of the halo error in the case of the same set of judges rating in moral character and intelligence contrasted with a different set of judges rating in the correlated traits, which is in substantial agreement with the finding for the two series of results first compared reported in this chapter, was offered in a preceding division of the research in connection with the interpretation of Table IX in Chapter IX.

STUDIES OF THE CORRELATION BETWEEN  
RATINGS IN MORAL AND INTELLECTUAL TRAITS  
AND OBJECTIVE MEASURES OF INTELLIGENCE

CHAPTER XX

A STUDY OF THE CORRELATION BETWEEN  
RATINGS IN MORAL AND INTELLECTUAL  
TRAITS AND COLLEGE MARKS

THIS chapter and the succeeding chapter are devoted to a detailed account of the two supplementary studies included in the investigation of the relation between moral and intellectual traits. The two chapters report in order a study of the correlation between ratings in moral and intellectual traits and college marks, and a study of the correlation between ratings in moral and intellectual traits and extra-curricular activities.

The study presented in the four sections of this chapter includes a consideration of the value of records of college marks as a measure of intelligence, a description of the data obtained for a study involving records of college marks, an explanation of the procedures required in determining the correlation with college marks, and the presentation and interpretation of the correlational results for college marks.

SECTION I

A CONSIDERATION OF THE VALUE OF RECORDS OF COLLEGE  
MARKS AS A MEASURE OF INTELLIGENCE

In the opening chapter of Part II, attention was called to the analogy between ratings in *Intellect as Shown in Studies* and records of college marks. For practical purposes both types of data may be considered measures of abstract intelligence. At the same time, complete correspondence cannot be expected between

them, in view of the fact that subjective ratings and objective records reflect reverse sides of the same shield.

Before considering the value of records of college marks in the present investigation, three shortcomings of these data may be pointed out. In the first place, scholastic records do not measure intelligence—much less abstract intelligence—only. To be sure, college marks measure in part innate ability to do the type of work required in a given course, but at the same time they undoubtedly measure acquired knowledge of the subject matter studied. In the second place, in addition to intellectual abilities and achievements, students' marks reflect certain health and character traits, including energy, vivacity, perseverance, effort,—even loquacity. In the third place, college marks are not wholly objective. They commonly represent not only the instructor's estimate of the student's mastery of the subject, but also his evaluation of various personality traits, plus more or less generous amounts—to borrow a Thorndikian phrase—of “faith and hope, or even charity” (cf. 169, p. 8).

Without minimizing the importance of these shortcomings, the practical advantages of records of college marks may be considered. In the first place, in the sense in which the term is used in this study, college marks are a valuable measure of abstract intelligence in that they tend to represent varying degrees of mastery of subject matter over a two- or four-year period, a mastery which—whatever else it may profit by—ultimately requires ability to learn, a most useful manifestation of intelligence. In the second place, college marks are a many-sided measure of intelligence in that they represent the student's standing in a variety of subjects, determined over a fairly long period of time by his several instructors. In the third place, college marks are a relatively objective measure of intelligence in that they represent the combined judgment of a considerable number of persons with reference to the abstract intelligence of the students graded, and hence are only moderately affected by individual idiosyncrasies in the grading, and are largely independent of the halo effect presumably characteristic of the ratings.

In view of these considerations, the value of records of college marks as a supplementary measure of intelligence in an investigation of the relation between moral and intellectual traits may be assumed to be established.

## SECTION 2

A DESCRIPTION OF THE DATA OBTAINED FOR A STUDY  
INVOLVING RECORDS OF COLLEGE MARKS

Since it did not appear necessary to include all of the twenty-eight institutions represented in the principal study in the two supplementary studies, a preliminary selection of institutions was made, which was governed in the main by the relatively satisfactory character of the returns already received.

The typical procedure in these instances was to address a letter to the registrar of the institution in question, requesting a sample copy of the scholastic record of a member of the senior class, and at the same time asking for information regarding the possible use of a point system of outside activities in that institution.

After the method of procedure had been determined upon, records of college marks were solicited from fourteen of the institutions tentatively selected, comprising one-half of the institutions cooperating in the investigation, the request meeting with a favorable response in ten instances. The records obtained were of three types, as follows: (1) transcripts of the scholastic records of individual students for the full college course expressed in numerical or in letter grades as assigned (obtained in five instances<sup>1</sup>); (2) a compilation of the scholastic records of the students for the full college course, indicating the number of hours earned by each student corresponding to the various marks assigned if letter grades were used, or to the steps in a frequency distribution if numerical grades were used (obtained in four instances); and (3) a statement of the average at graduation and the rank in the class assigned to each student (obtained in one instance).

Although the data obtained from the ten institutions supplying the three types of records were all subjected to correlational analysis, the results for two colleges were later discarded,<sup>2</sup> in one case because of the unsatisfactory quality of the ratings submitted, and in the other case because of the apparently indiscriminate use of high marks.

<sup>1</sup>Complete transcripts were obtained in four instances, and abbreviated transcripts recording the essential facts in the fifth.

<sup>2</sup>The colleges in question were Institutions 10 and 25.

The list of eight institutions finally included in the study of the correlation between ratings in moral and intellectual traits and college marks is as follows:

University of Arkansas	University of Nevada
Cornell College	Swarthmore College
Heidelberg University	Washburn College
Lincoln University	William Woods College

The records of college marks obtained in these instances supplied information as to scholastic achievement for all or nearly all of the students retained as subjects in the principal study in the case of six of the eight institutions. The two remaining institutions were characterized by an exceptionally large percentage of omissions, due in the first case mainly to the fact that the information requested could not be supplied for the students who had enlisted in the Army before graduation, and in the second case to the fact that records were requested for only a random sampling of the students for whom ratings had previously been requested because of the relatively large number of students in the senior class.<sup>3</sup>

The data utilized in the study of college marks are summarized in the tabulation on the following page.

### SECTION 3

#### AN EXPLANATION OF THE PROCEDURES REQUIRED IN DETERMINING THE CORRELATION WITH COLLEGE MARKS

After the records of college marks for the different institutions had been procured, the main problem which called for solution was a proper evaluation of the marks recorded, in order to provide satisfactory measures of scholastic achievement for correlational analysis.

In the case of one institution, as already stated, the rank in the class assigned to each student had been obtained. This information supplied by the institution itself thus afforded the necessary

<sup>3</sup>It should be noted that, although in this case records for thirty students representing approximately one-third of the students for whom ratings had previously been requested were obtained, fourteen of these records had later to be discarded because the students concerned were eliminated by the application of the routine procedures for the treatment of faulty data outlined in Chapter XVII.

Key No. of Insti- tution	Type of Records of College Marks Available	No. of Years Covered by Records	No. of Students Retained as Subjects <i>Represented in</i>		
			<i>Records Obtained</i>	<i>Principal Study</i>	<i>Present Study</i>
RATINGS BY FACULTY JUDGES					
20	Transcripts (letter grades)	4	40	40	40
12	Compilation (letter grades)	4	37	37	37
22	Statement of class average and rank	4	24	32	24
1	Compilation (letter grades)	4	40	40	40
16	Transcripts (numerical grades)	2	15	17	17
23	Transcripts (letter grades)	4	16	46	16
9	Transcripts (letter grades)	4	44	45	45
19	Transcripts (numerical grades)	4	16	17	17
RATINGS BY STUDENT JUDGES					
9	Transcripts (letter grades)	4	70	77	77
16	Transcripts (numerical grades)	2	15	17	17
22	Statement of class average and rank	4	24	32	24

figures for use in a correlational study, and the corresponding rank order series was entered opposite the key numbers of the students concerned.

In the case of the remaining institutions more or less complicated methods of evaluation of the marks recorded were required, the particular procedure employed for a given institution being determined by the type of records available, and also by the type of college marks (whether numerical grades or letter grades) assigned in the institution in question.

If the data available consisted of transcripts of scholastic records expressed in numerical grades, the method of evaluation employed merely called for weighting the marks assigned in the

various subjects by the number of hours of credit earned in each case.

On the other hand, if the data available consisted of transcripts or of a compilation of scholastic records expressed in letter grades,<sup>4</sup> it became necessary to translate these symbols into their most probable numerical equivalents. When information as to the approximate numerical equivalents of the letter grades used could be found in the catalogue of the institution, this was taken as the basis. In other cases an arbitrary assignment was made in accordance with the following schedule:

(1) In case three grades above passing were awarded in the institution, values were assigned as follows:

(a) The highest grade awarded was taken to extend from 90 to 100, the middle grade above passing from 80 to 90, and the lowest grade above passing from 70 to 80, the value of the mid-point being used in each case.

(b) A grade of conditioned was taken to extend from 60 to 70, the value of the mid-point being used, and a grade of failure was rated 0.

(2) In case four grades above passing were awarded in the institution, values were assigned as follows:

(a) The highest grade awarded was taken to extend from 95 to 100, the next highest grade awarded from 85 to 95, the next to the lowest grade above passing from 75 to 85, and the lowest grade above passing from 70 to 75, the value of the mid-point being used in each case.

(b) A grade of conditioned was taken to extend from 60 to 70, the value of the mid-point being used,<sup>5</sup> and a grade of failure was rated 0.<sup>6</sup>

<sup>4</sup>Although compilations of scholastic records expressed in numerical grades were obtained in two instances, the institutions in question chanced to be the two which were not included in the final selection for the reasons given in the preceding section. The procedure followed in these instances involved the assignment of a mid-point value after the manner described above.

<sup>5</sup>A grade recorded as conditioned with condition removed was credited with the numerical value assigned to the grade conditioned plus one-third of the credit added by the grade assigned when the condition was removed.

This rule was similarly applied when an assignment of values on the basis of information given in the catalogue had been made.

<sup>6</sup>Since in the case of one institution the number of grades awarded above passing had shifted from three to four within the four-year period of attendance of the students for whom ratings were requested, the values of the mid-points to be used in this instance were determined by the number of hours of credit corresponding to each grade which had been awarded under

Before the actual weighting of credits could be carried to a conclusion, a further step required in every case in which the nature of the records permitted was to divide the data in such a way that two measures of college marks could be obtained for the sake of correction for attenuation. In the case of transcripts expressed in numerical grades, this purpose was accomplished by appropriate entries on the transcripts themselves recording separately the sum of the weighted credits for alternate halves of the data. In the case of transcripts expressed in letter grades, this need was met by the preparation of a compilation of the scholastic records with specific provision for separate entries for two equivalent halves of the college course. In the case of the statement of class average and rank or the compilations obtained directly from institutions, provision for two measures was impossible except in one record of the latter type in which the grades assigned in the freshman and sophomore years had been recorded separately from those assigned in the junior and senior years because of a change in the marking system.<sup>7</sup>

Because of differences in the records supplied by the various institutions, the procedure followed in subdividing the data was not uniform. In the largest number of cases, including Institutions 20, 23, and 19, the average grade for the freshman and senior years was chosen as one measure, and the average grade for the sophomore and junior years as the other. In the case of Institution 16, a junior college, the average grades for odd-numbered and even-numbered courses throughout the two years were chosen in preference to the average grades for the first and second years, the courses taken by the individual students as entered on the transcripts first having been numbered consecutively. This method was also decided upon in the case of Institution 9, because the transcripts of scholastic records as prepared

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each system, the records of slightly less than one-half of the students being adapted for use in this determination, however, since in the remaining instances the transcripts failed to show what courses were pursued in a given year.

Although a similar shift occurred in the case of a second institution, the routine method was applicable because the grades assigned under the two systems were identifiable.

<sup>7</sup> Since two of the four compilations obtained were for the two institutions later discarded in the study, a division of the data into two halves was thus possible in one of the two cases of this type included in the study.



failed to show what courses were pursued in a given year for a large number of the students. In the case of Institution 1, because of a change in the marking system already referred to, the average grade for the freshman and sophomore years was chosen as one measure, and the average grade for the junior and senior years as the other.

As soon as the system of numerical equivalents had been determined upon and provision for the division of the data had been made wherever possible, the procedure involved in the application of the appropriate system to the college marks recorded for individual students and the final preparation of the data for correlational analysis was straightforward. First, the sum of the number of hours of credit corresponding to each letter grade multiplied by the value of the letter grade in question, or, if numerical rather than letter grades had been assigned, the sum of the weighted marks, was obtained for the students who had been retained as subjects in the principal study, either for the data as a whole or for the two halves of the data. Thereafter, the average grades for the full college course or for the two halves of the college course were determined by dividing this sum by the corresponding total number of hours of credit to which grades had been assigned earned by each subject. Lastly, the series of measures thus provided were ranked in order, beginning with the highest average grade, and the resulting series of ranks were entered opposite the key numbers of the students concerned.

In connection with this last step, omissions in the case of the five institutions in which the students retained as subjects in the principal study included students not represented by records of college marks<sup>8</sup> were provided for by one of the procedures described below:

(1) In the case of institutions in which the omissions in the records obtained amounted to less than one-eighth of the number of students retained as subjects in the ratings by faculty judges or the ratings by both faculty and student judges, the middle rank<sup>9</sup> or

<sup>8</sup> The extent to which omissions occurred in the records obtained for a given institution can be ascertained by referring to the tabulation of the data utilized in the present study given in the preceding section, except in the case of Institution 1, in which instance an omission occurred for two subjects in different halves of the data.

<sup>9</sup> In an even number of cases the second of the two middle ranks was assigned.

its near equivalent<sup>10</sup> was arbitrarily assigned to the subjects for whom no records of college marks were available in one or both of the alternate halves of the data.

(2) In the case of institutions in which the omissions in the records obtained exceeded one-eighth of the number of students retained as subjects in the ratings by faculty judges or the ratings by both faculty and student judges, the data utilized in the principal study were reranked with all cases not also represented by the required records of college marks eliminated.

The ranks assigned in the manner described provided the necessary figures for a correlational study involving college marks. Accordingly, therefore, the required coefficients of correlation between ratings in moral and intellectual traits or their composites and college marks, and in addition a reliability coefficient between the two measures of college marks in the cases in which this was possible, were calculated by the rank-difference method for the eight institutions included in the study. In these calculations the customary procedure of correlating random halves of the data was followed in all cases in which two measures of college marks were available, the appropriate alternate and reliability coefficients being subsequently combined in the formula for correction for attenuation in order to obtain the corrected coefficients for the various relationships investigated.<sup>11</sup>

In the two instances in which a single measure of college marks was available, the customary procedure of correlating random halves was modified to this extent that alternate halves of the data for the ratings were correlated with all of the data for college marks, and a weighted mean of the reliability coefficients for the

<sup>10</sup> That is, a rank in the last half of the series as near the middle rank as possible in view of the number of omissions. It should be noted that this procedure was modified in the case of Institution 9 to this extent that the routine adjustments were made only in the data to be correlated with ratings by student judges, and the resulting ranks which were also represented by ratings by faculty judges were subsequently reranked for use with the latter series of ratings, provision being made in the reranking for the inclusion of the record of one student who was not retained in the ratings by student judges.

<sup>11</sup> It should be noted that the resulting coefficients in their report and interpretation were subjected to the same requirements as to reliability and consistency formulated for the correlational results obtained in the study of the correlation between ratings in moral and intellectual traits. Detailed rules governing the report and the interpretation of routine correlational results obtained for selected institutions will be found in Appendix II, Section 2.

five other four-year institutions was calculated as an approximate figure for use in the correction for attenuation formula.<sup>12</sup> Thereupon, the appropriate alternate and reliability coefficients were combined in the formula in routine fashion for the calculation of the required corrected coefficients.<sup>11</sup>

Finally, the probable errors of the new reliability coefficient and the alternate coefficients involved in the correlations with college marks were obtained by the routine procedures for this purpose used in the investigation.<sup>13</sup>

#### SECTION 4

##### THE PRESENTATION AND INTERPRETATION OF THE CORRELATIONAL RESULTS FOR COLLEGE MARKS

The presentation and interpretation of the correlational results for college marks included in this section is concerned with a single series of coefficients: coefficients of correlation between ratings in moral and intellectual traits or their composites and college marks. The series of coefficients specified will now be considered.

##### *Coefficients of Correlation between Ratings in Moral and Intellectual Traits or Their Composites and College Marks*

Table XVIII presents coefficients of correlation between ratings in moral and intellectual traits or their composites and college marks. This table is of interest because it affords evidence as to the relation between moral and intellectual traits and an objective measure of abstract intelligence.

The table has two major divisions, which serve to differentiate the various coefficients according to the type of judges submitting ratings. These major divisions are designated as follows:

- A. Calculated from Ratings by Faculty Judges.
- B. Calculated from Ratings by Student Judges.

<sup>12</sup> In the calculation of this figure the five reliability coefficients indicated, in each case carried out to four decimal places, were multiplied by the number of students retained as subjects, and the sum of these products was then divided by the total number of cases to give the required estimated coefficient.

<sup>13</sup> Described in the third section of Chapter XVII.

TABLE XVIII  
COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS  
OR THEIR COMPOSITES AND COLLEGE MARKS  
*A. Calculated from Ratings by Faculty Judges*

KEY NO. OF INST- TUTION	FINAL GRADE ASSIGNED TO RATINGS	NO. OF STUDENTS RETAINED AS SUBJECTS	RELIABILITY COEFFICIENT <sup>a</sup> WITH PROBABLE ERROR	ALTERNATE COEFFICIENTS <sup>b</sup>								CORRECTED COEFFICIENTS <sup>b</sup>				QUALITATIVE WEIGHT ASSIGNED TO COEFFICIENTS	
				CM1CM2	M1CM2	M2CM1	IS1CM2	IS2CM1	IA1CM2	IA2CM1	IS-IA1CM2	IS-IA2CM1	M CM	IS CM	IA CM		IS-IA CM
20	A	40	.91±.02	.56	.51	.69	.90	.52	.63				.60	.93	.69		4
12	A	37	(.84)	.33	.38	.63	.46	.22	.19				.45	.71	.27		4
22	B	24		.50	.48	.95	.81	.70	.77				.77	1.07	.98	1.00	3
1	B	40	.82±.04	—	.19	.60	.80	.07	.27	.88		.80	.02	1.05	.28		3
16	C	17	.74±.09	.35	.60	.71	.80	.37	.42	.67	.70	.59	.97	.97	.62	.88	2
23	C	16	.72±.10	.71	.14	.82	.52	.46	.01			.62	1.03	.16			2
9	D	45	.83±.03	.57	.37	.73	.60	.46	—	.67	.39	.88	.91	.42	.80		1
19	D	17	.84±.06	.66	.14	.71	.74	.20	.15			.58	.89	...			1

## B. Calculated from Ratings by Student Judges

KEY NO. OF INSTI- TUTION	FINAL GRADE ASSIGNED TO RATINGS	NO. OF STUDENTS RETAINED AS SUBJECTS	RELIABILITY COEFFICIENT <sup>a</sup> WITH PROBABLE ERROR	ALTERNATE COEFFICIENTS <sup>b</sup>								CORRECTED COEFFICIENTS <sup>b</sup>				QUALITATIVE WEIGHT ASSIGNED TO COEFFICIENTS
				CMCM <sub>2</sub>	U-R(CM) <sub>2</sub>	IS(CM) <sub>2</sub>	IS(CM) <sub>1</sub>	IA(CM) <sub>2</sub>	IA(CM) <sub>1</sub>	IS-IA(CM) <sub>2</sub>	IS-IA(CM) <sub>1</sub>	U-R CM	IS CM	IA CM	IS-IA CM	
9	A	77	.84±.02		.43	.07	.58	.42	.23	.18	.46	.27	.77	.45	.69	4
16	C	17	.74±.09		.25	.10	.80	.81	.13	—	.68	.23	1.03	—	.84	2
22	C	24	(.84)		— .17	— .22	.85	.70	.78	.05	.86	— .24	.98	.45	.89	2

## KEY TO SYMBOLS

CM College Marks. M Morality in the Broadest Sense. IS Intellect as Shown in Studies. IA Intellect as Shown in Activities Other than Studies.  
 IS-IA Composite of Intellectual Traits. U-R Composite of Moral Traits. Subscript 1 First Half of Data. Subscript 2 Second Half of Data.

<sup>a</sup> Reliability coefficients in parentheses were supplied because only one measure of college marks was available for the institutions in question. The figure supplied represents the weighted mean of the reliability coefficients for the five four-year institutions with two measures of college marks, the weight applied to the individual coefficients being the number of students retained as subjects for the institution concerned.

The reliability coefficients for ratings in moral and intellectual traits and their composites utilized in calculating corrected coefficients, reported as usual to two places only, may be ascertained by consulting the appropriate entries for the institutions in question in Tables XIII and XVI in the case of ratings by faculty judges, and in Tables XIV and XVI in the case of ratings by student judges. It will be observed that the number of students retained as subjects in the calculation of these reliability coefficients corresponds to the number retained as subjects in the calculation of the coefficients reported above for the same institutions, with the following exceptions: Institution 22, represented by a group of 32 students in the tables referred to in the case of ratings by both faculty and student judges, and Institution 23, represented by a group of 46 students in one of the tables referred to in the case of ratings by faculty judges.

<sup>b</sup> Since only one measure of college marks was available for Institutions 12 and 22, as indicated by the preceding footnote, the alternate coefficients reported for these institutions are M<sub>1</sub>CM<sub>1</sub>, M<sub>2</sub>CM<sub>1</sub> (or U-R-CM<sub>1</sub>), IS<sub>1</sub>CM<sub>1</sub>, IS<sub>2</sub>CM<sub>1</sub>, IA-CM<sub>1</sub>, IA-CM<sub>2</sub>, and IS-IA-CM<sub>1</sub>, respectively.

Alternate coefficients which correspond to omitted or italicized corrected coefficients, and likewise italicized corrected coefficients, are disregarded in subsequent discussion, and also (if pertinent) in the compilations of correlational results, because the data involved failed to meet the requirements as to reliability and consistency formulated in the course of the investigation (cf. Appendix II, Section 2).

These two divisions of the table include the key number of the institution for the eight selected institutions represented by faculty judges and the three selected institutions represented by student judges, the final grade assigned to the ratings by faculty or by student judges, the number of students retained as subjects in the investigation, the reliability coefficient for the objective measure correlated with its probable error, the alternate and the corrected coefficients calculated between ratings in moral and intellectual traits or their composites and college marks, and the qualitative weight assigned to the coefficients for each institution in the compilation of correlational results.

The traits and the objective measure correlated in this series of coefficients for the ratings by the two types of judges are given below:

#### RATINGS BY FACULTY JUDGES

Morality in the Broadest Sense (*M*), Intellect as Shown in Studies (*IS*), Intellect as Shown in Activities Other than Studies (*IA*), and Composite of Intellectual Traits (*IS-IA*) with College Marks (*CM*).

#### RATINGS BY STUDENT JUDGES

Composite of Moral Traits (*U-R*), Intellect as Shown in Studies (*IS*), Intellect as Shown in Activities Other than Studies (*IA*), and Composite of Intellectual Traits (*IS-IA*) with College Marks (*CM*).

Of the resulting coefficients, the first in the case of ratings by both faculty and student judges are of significance in a consideration of the relation between moral traits and an objective measure of abstract intelligence; whereas the remaining coefficients in the case of both types of ratings are of significance in a consideration of the relation between intellectual traits and an objective measure of abstract intelligence.

The coefficients of correlation between ratings in moral and intellectual traits or their composites and college marks presented in Table XVIII afford practically consistent evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

- (1) There are eight institutions represented in the coefficients calculated from ratings by faculty judges, and three institutions

represented in the coefficients calculated from ratings by student judges.

(2) The final grades assigned to the ratings range from A' to D in the case of ratings by faculty judges with an equal number of institutions in each group, and from A to C in the case of ratings by student judges with C as the most frequent grade.

(3) The number of students retained as subjects ranges from 45 to 16 in the case of ratings by faculty judges, and from 77 to 17 in the case of ratings by student judges, with 37 and 24 as the two middle numbers in the former instance and with 24 as the median number in the latter instance, and with 236 and 118, respectively, as the total numbers of students retained in the two instances.

(4) The reliability coefficients for the relatively objective measure of abstract intelligence are high without exception, both in the case of ratings by faculty judges and in the case of ratings by student judges: moreover, the reliability coefficients are more than five times their probable errors<sup>14</sup> in every instance in the case of ratings by both types of judges. In view of the greater subjectivity of the ratings for the intellectual trait denoting abstract intelligence, it is also of interest to observe by reference to Tables XIII and XIV that the reliability coefficients for the intellectual trait in question are lower than the corresponding reliability coefficients for the relatively objective measure of abstract intelligence under consideration for five of the six institutions compared in the case of ratings by faculty judges, and for one of the two institutions compared in the case of ratings by student judges.

(5) The alternate coefficients for the measures correlated, although at times widely divergent, meet the minimum standard of agreement required<sup>15</sup> in the case of twenty-six of the twenty-seven pairs calculated from ratings by faculty judges for the eight institutions concerned, and ten of the twelve pairs calculated from ratings by student judges for the three institutions concerned.

(6) The corrected coefficients for the measures correlated, although extremely variable, tend in general to be marked in the case of ratings by faculty judges and to be negligible or low in the case of ratings by student judges for correlations with moral traits or the intellectual trait denoting social intelligence, and to be high in both cases for correlations with the intellectual trait denoting abstract intelligence or the combined intellectual traits, as shown by the following tabulation:

<sup>14</sup> Probable errors are given only for the reliability coefficients calculated from the original data in routine fashion.

<sup>15</sup> If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

Traits Correlated	No. of Coeffi- cients <sup>a</sup>	Corrected Coefficients <i>Weighted Mean or Weighted Quartile Points<sup>b</sup></i> <i>Median</i> <i>or Mean<sup>c</sup></i>			<i>Q<sub>1</sub> and Q<sub>3</sub></i>
A. CALCULATED FROM RATINGS BY FACULTY JUDGES					
Morality in the Broadest Sense ( <i>M</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	8	.60	.47	...	.64
Intellect as Shown in Studies ( <i>IS</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	8	.94	.90	...	1.05
Intellect as Shown in Activi- ties Other than Studies ( <i>IA</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	6	.44	.26	...	.68
Composite of Intellectual Traits ( <i>IS-IA</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	3	.94			
B. CALCULATED FROM RATINGS BY STUDENT JUDGES					
Composite of Moral Traits ( <i>U-R</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	2	*.00			
Intellect as Shown in Studies ( <i>IS</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	3	.87			
Intellect as Shown in Activi- ties Other than Studies ( <i>IA</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	2	*.21			
Composite of Intellectual Traits ( <i>IS-IA</i> ) with					
College Marks ( <i>CM</i> ) . . . . .	3	.74			

<sup>a</sup> All italicized coefficients reported in Table XVIII are excluded in this tabulation.

<sup>b</sup> The method of weighting used in the tabulation is qualitative, the weight applied to each coefficient corresponding to the final grade assigned to the ratings submitted by faculty or student judges for the institution in question.

<sup>c</sup> A weighted mean is distinguished from a weighted median by an asterisk.

(7) The qualitative weights assigned to the coefficients range from 4 to 1 in the case of ratings by faculty judges, and from 4 to 2 in the case of ratings by student judges, according to the final grades assigned to the ratings, with an equal number of each weight in the former instance and with 2 as the most frequent weight in the latter instance.



A cross-comparison of the corrected coefficients for ratings in moral traits by faculty and student judges correlated with college marks, reported in Table XVIII, and the corresponding corrected coefficients for ratings in moral traits correlated with ratings in intellectual traits in the case of both faculty and student judges, reported in Tables XIII and XVI, respectively, affords the following information as to the effect of the halo error upon the relation between moral character and abstract intelligence found in the investigation:<sup>16</sup>

(1) In the case of ratings by faculty judges a change from a subjective to a relatively objective measure of abstract intelligence apparently tends to be accompanied by a slight decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.045$ , the second of these coefficients being lower than the first for six of the eight institutions represented in the comparison.<sup>17</sup>

(2) In the case of ratings by student judges this change apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the mean difference between the contrasted coefficients is  $-.17$ , the second of these coefficients being consistently lower than the first for the two institutions represented in the comparison.<sup>18</sup>

It is of interest to note that the finding of a lower degree of relationship between moral character and abstract intelligence in the case of ratings by faculty and student judges, when ratings in an intellectual trait indicating scholastic success are replaced by a rela-

<sup>16</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed, an italicized coefficient reported in Table XVIII, however, being disregarded because of the unsatisfactory character of the data from which it was derived. In the case of ratings by faculty judges the simple median of these differences, and in the case of ratings by student judges the simple mean, is reported.

<sup>17</sup> The corrected coefficients involved in the comparison for ratings by faculty judges in the order in which they are used in the discussion are (1) the coefficients calculated between Morality in the Broadest Sense and Intellect as Shown in Studies (*M IS*), reported in Table XIII, and (2) the coefficients calculated between Morality in the Broadest Sense and College Marks (*M CM*), reported in Table XVIII.

<sup>18</sup> The corrected coefficients involved in the comparison for ratings by student judges in the order in which they are used in the discussion are (1) the coefficients calculated between Composite of Moral Traits and Intellect as Shown in Studies (*U-R IS*), reported in Table XVI, and (2) the coefficients calculated between Composite of Moral Traits and College Marks (*U-R CM*), reported in Table XVIII.

tively objective measure of scholastic success, is in accord with the result to be expected in view of the assumed effect of the halo error upon the correlation between ratings in moral and intellectual traits. Moreover, the genuineness of the halo error is further confirmed by a similar finding in the case of ratings by faculty judges for the study of the correlation between ratings in moral and intellectual traits and extra-curricular activities reported in the succeeding chapter.<sup>19</sup> Notwithstanding, the numerical results of the comparison cannot be construed as an indication of the magnitude of the halo error in the case of Ratings as to Abstract Intelligence for the two types of judges concerned, in view of an indifferent result for ratings by student judges in the study referred to, and in view of the many factors involved in the correlations, including a larger number of student judges than of faculty judges and the use of a composite of moral traits in the case of ratings by student judges, and also presumably including a slight persistence of the halo error in the correlations with college marks in the case of ratings by faculty judges, since the teachers who assigned the ratings doubtless also assigned some of the college marks from which the average grade used in the calculations was obtained.

In summary, then, it may be said that coefficients of correlation between ratings in moral and intellectual traits or their composites and college marks point to a direct and marked relation between moral character and intelligence among college students in the United States if ratings by faculty judges are taken as the basis of decision, and to an indifferent relation between these two qualities if ratings by student judges are taken as the basis. Since, however, the evidence presented in the former instance is far more adequate than the evidence presented in the latter instance, and since all but one of the individual coefficients calculated from ratings by faculty judges are marked or high, notwithstanding the fact that the individual coefficients calculated from ratings by student judges are low in both instances (one of these being posi-

<sup>19</sup> It will be recalled that, although an indifferent result failed to add assurance, further proof of the influence of the halo error in the case of Ratings as to Abstract Intelligence contrasted with Reports of Educational Achievement, and likewise with Results of Tests of Verbal Abstract Intelligence, which is in substantial agreement with the finding reported in this chapter, was offered in a preceding division of the research in connection with the interpretations of Tables VIII and IX in Chapter IX.

tive and the other negative), the presence of a marked relation may possibly be regarded as established. Moreover, the probability that the relationship in question is actually marked rather than low is increased by the fact that this result is doubtless affected by the various extraneous and selective factors that were analyzed in the case of coefficients of correlation between ratings in moral and intellectual traits, with this important exception that the halo error ceases to be prominent when a relatively objective measure of abstract intelligence replaces the corresponding series of ratings in intellectual traits. In consequence, therefore, the total effect of these factors in the present instance is possibly to lower the degree of relationship found.

## CHAPTER XXI

### A STUDY OF THE CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS AND EXTRA-CURRICULAR ACTIVITIES

A STUDY of the correlation between ratings in moral and intellectual traits and extra-curricular activities as presented in the four sections of this chapter includes a consideration of the value of reports of extra-curricular activities as a measure of intelligence, a description of the data obtained for a study involving reports of extra-curricular activities, an explanation of the procedures required in determining the correlation with extra-curricular activities, and the presentation and interpretation of the correlational results for extra-curricular activities.

#### SECTION I

##### A CONSIDERATION OF THE VALUE OF REPORTS OF EXTRA-CURRICULAR ACTIVITIES AS A MEASURE OF INTELLIGENCE

In the opening chapter of Part II, attention was called to the analogy between ratings in *Intellect as Shown in Activities Other than Studies* and reports of extra-curricular activities. For practical purposes both types of data may be considered measures of social intelligence, in the same manner that ratings in *Intellect as Shown in Studies* and records of college marks may be considered measures of abstract intelligence. Again, however, complete correspondence cannot be expected between them, in view of the fact that subjective ratings and objective reports likewise reflect reverse sides of the same shield.

Before considering the value of reports of extra-curricular activities in the present investigation, two shortcomings of these data may be pointed out. In the first place, the information as to activities given in the college annual or the college paper is sub-

ject to errors of memory on the part of the reporters. In the second place, this information may be misleading. Thus participation in a certain activity in one institution may be notably unlike participation in an activity of the same name in another institution; in fact, under certain circumstances participation in the same activity in one institution for two different years may call for a dissimilar expenditure of time and effort and the exercise of unlike abilities.

Genuine as are these shortcomings, the practical advantages of reports of extra-curricular activities are none the less real, and far more important. In the first place, in the sense in which the term is used in this study, extra-curricular activities are a valuable measure of social intelligence in that they indicate the actual activities calling for social contacts and experience and some degree of social success in which the students have engaged outside the classroom and the study hall over a period of from two to four years, and thereby tend to reveal the interests, the popularity, and the executive ability of the students reported upon. In the second place, extra-curricular activities are a relatively objective measure of intelligence in that the facts with reference to social intelligence which they report are not subject to errors of opinion. In the third place, however little judges may differentiate between intellect as shown in studies and intellect as shown in activities other than studies, records of college marks and reports of extra-curricular activities could hardly be more unlike. The two types of objective measures may thus be expected to supplement each other, and to serve as a check upon the genuineness and the strength of the halo effect assumed to be present in the ratings.

In view of these considerations, the value of reports of extra-curricular activities as a supplementary measure of intelligence in an investigation of the relation between moral and intellectual traits may be assumed to be established.

## SECTION 2

### A DESCRIPTION OF THE DATA OBTAINED FOR A STUDY INVOLVING REPORTS OF EXTRA-CURRICULAR ACTIVITIES

Since, as indicated in the preceding chapter, it did not appear necessary to include all of the twenty-eight institutions represented

in the principal study in the two supplementary studies, a preliminary selection of institutions was made as in the case of records of college marks.

It will be recalled that the letter sent to these institutions included a question as to the possible use of a point system of outside activities in the institution in question. A logical method of determining the final selection of institutions for the present study would thus appear to be to choose those institutions in which a point system of evaluating extra-curricular activities was in operation. As a matter of fact, however, apparently only four of the fifteen institutions who supplied information in regard to the matter were making use of an objective system of this character, and in one case the system described was too limited to be of use in the study. The further selection of institutions was therefore governed in the main by the adequacy of the ratings submitted by faculty and student judges, and the availability of records of college marks.

Unless a copy of the annual student publication had already been obtained from that institution, the procedure usually followed was to address a letter to the business manager of the college yearbook, requesting a copy of the yearbook or information as to where it might be procured.

Eventually reports of extra-curricular activities were obtained from eight institutions, although they were solicited from a somewhat larger number. The reports obtained were of two types, as follows: (1) an itemized list of student activities, showing participation in college affairs by individual students, included in the college yearbook, covering three years of college attendance if a junior annual and the full period of attendance if a senior annual (obtained in six instances); and (2) a similar list of student activities included in the senior edition of the college paper, covering all of the period of attendance (obtained in two instances).

Before the data obtained from the eight institutions supplying the two types of reports were subjected to correlational analysis, the reports for three colleges were discarded,<sup>1</sup> in one case because of the unsatisfactory character of some of the ratings, in another case because of the unavailability of records of college marks, and in the third case because of the small number of faculty

<sup>1</sup> The colleges in question were Institutions 10, 11, and 23.

and student judges and the fragmentary character of the data.

The list of five institutions finally included in the study of the correlation between ratings in moral and intellectual traits and extra-curricular activities is as follows:

Cornell College	University of Nevada
Heidelberg University	Washburn College
William Woods College	

The reports of extra-curricular activities obtained in these instances supplied information regarding student participation in college affairs for all or practically all of the students retained as subjects in the principal study in the case of four of the five institutions. The remaining institution was characterized by an exceptionally large percentage of omissions, no specific explanation, however, being assignable.

The data utilized in the study of extra-curricular activities are summarized in the following tabulation:

Key No. of Insti- tution	Type of Reports of Extra-Curricular Activities Available	No. of Years Covered by Reports	No. of Students Retained as Subjects		
			<i>Reports Obtained</i>	<i>Represented in Principal Study</i>	<i>Present Study</i>
RATINGS BY FACULTY JUDGES					
20	Senior annual	4	39	40	40
12	Senior annual	4	35	37	37
16	Senior annual	2	17	17	17
9	Junior annual	3	39	45	39
19	College paper	4	17	17	17
RATINGS BY STUDENT JUDGES					
9	Junior annual	3	63	77	63
16	Senior annual	2	17	17	17

### SECTION 3

#### AN EXPLANATION OF THE PROCEDURES REQUIRED IN DETERMINING THE CORRELATION WITH EXTRA- CURRICULAR ACTIVITIES

After the reports of extra-curricular activities for the different institutions had been procured, the main problem which

called for solution was a proper evaluation of the activities reported, in order to provide satisfactory measures of student participation in college affairs for correlational analysis.

As already indicated, only three of the four institutions making use of a point system of evaluating extra-curricular activities had devised one satisfactory for use in the study. These three institutions were Bates College, Cornell College, and William Woods College, thus including two of the institutions finally selected for representation in the present study. In these three instances copies of the point systems in use in the institution in question had been supplied in typewritten or in printed form.<sup>2</sup> The point systems for the three institutions were all utilized in determining the number of points to be assigned to the various activities, and will henceforth be referred to as the official point systems in this discussion.<sup>3</sup>

It was at first planned to make use of the official point systems of Cornell College and William Woods College for their respective institutions without alteration. This procedure was abandoned, however, after it became apparent that these point systems failed to provide for many of the activities recorded. The procedure finally followed, which proved to be satisfactory, was the construction of two rather elaborate point systems, subsequently referred to as the adapted point systems.<sup>4</sup> The first of these point systems was designed to cover the needs of the four four-year colleges included in the investigation, and the second, the needs of the one junior college. The basis of the former was the official point system for Cornell College, and of the latter, the official point system for William Woods College.

These adapted point systems incorporated as elements the activities specified in the official point system of the appropriate in-

<sup>2</sup> Typewritten copies of the point systems in use in Bates College and William Woods College were supplied by administrative officers in the two institutions. The point system for Bates College was stated to be tentative in the letter of transmission. The point system for Cornell College was obtained in printed form in a booklet issued by the Women's League of that institution.

<sup>3</sup> Although both Bates College and Cornell College are coeducational institutions, their point systems applied only to the women of the respective institutions. Since William Woods College enrolls young women only, the third point system supplied also had reference solely to young women.

<sup>4</sup> The adapted point systems used in the evaluation of extra-curricular activities both for the four-year coeducational institutions and for the junior college for women are reproduced in Appendix II, Section 5, A and B.



stitution which were found in the reports of the students utilized as subjects in the study, and as additional elements the activities not specified in the official list which were also reported for these subjects.<sup>5</sup> The main activities represented by the students in the five institutions were the holding of offices, membership in various organizations, and participation in athletics, public speaking, and student publications.<sup>6</sup> Points were assigned to the activities represented by the different students as follows:

(1) The number of points specified for activities in the two official lists indicated were first doubled in order to permit a wider range of credits, and then transferred to the proper items in the corresponding adapted point systems, no further change being made unless further differentiation in the activity seemed desirable.

(2) The activities not provided with credits by this means in a given adapted point system were apportioned credits adjudged to be equitable in relation to the credits already assigned, after an examination of the points allotted to such activities, if any, in the two other point systems available,<sup>7</sup> and after a consideration of the activity in question as known to the author from association with the institution<sup>8</sup> or from a study of the yearbooks or the catalogues of the colleges concerned.<sup>9</sup>

As soon as the adapted point systems were completed, the procedure involved in the application of the appropriate system to the extra-curricular activities reported for individual students and the final preparation of the data for correlational analysis was straightforward. First, the appropriate number of points was entered in order for the activities listed in the source<sup>10</sup> opposite the

<sup>5</sup> In the adapted point system for the four-year colleges the activities of all of the subjects in the four four-year institutions were provided for.

<sup>6</sup> Since no information as to the self-help positions held by the students was given, data of this character were not included in the study.

<sup>7</sup> The Bates College official point system was especially useful in this connection, since it included credits for a considerable number of athletic activities, whereas such activities were not provided for in the other official lists.

<sup>8</sup> As it chanced, the author had been a student in Cornell College as late as the second school year preceding that in which a majority of the students who served as subjects entered the institution, and had served as a teacher in William Woods College the year previous to the biennium covered by the records of most of the subjects for that institution.

<sup>9</sup> Men and women were allowed the same credit for participation in a given activity, since differentiation of credits according to sex did not appear feasible.

<sup>10</sup> In the case of a double office (secretary-treasurer), the sum of the points for the two offices was entered. Furthermore, zero credits (not provided for in the adapted point systems) were assigned in the following instances:

key numbers of the students who had been retained as subjects in the principal study. Thereafter, the sum of the odd entries and the sum of the even entries were obtained as a means of providing the two measures of extra-curricular activities required for the sake of correction for attenuation. Lastly, the series of measures thus provided were ranked in order, beginning with the highest number of points.

In connection with this last step, omissions in the case of the three institutions in which the students retained as subjects in the principal study included students not represented by reports of extra-curricular activities<sup>11</sup> were provided for by one of the procedures described below:

(1) In the case of institutions in which the omissions in the reports obtained amounted to less than one-eighth of the number of students retained as subjects in the ratings by faculty judges, the middle rank<sup>12</sup> or its near equivalent<sup>13</sup> was arbitrarily assigned to the subjects for whom no reports of extra-curricular activities were available.

(2) In the case of an institution in which the omissions in the reports obtained exceeded one-eighth of the number of students retained as subjects in the ratings by both faculty and student judges, the data utilized in the principal study were reranked with all cases not also represented by the required reports of extra-curricular activities eliminated.

The ranks assigned in the manner described provided the necessary figures for a correlational study involving extra-curricular activities. Accordingly, therefore, the required coefficients of correlation between ratings in moral and intellectual traits or their

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(1) attendance at another college, a separate zero credit being assigned for each year of attendance elsewhere, if the number of years was given; (2) membership in the senior class of the high school connected with the college in question; (3) connection with the institution as an instructor or assistant in some department; and (4) designation as an honor student or the recipient of a scholarship.

It should be explained that zero credits were assigned to the items last mentioned because they usually reflect intellect as shown in studies rather than intellect as shown in activities other than studies.

<sup>11</sup> The extent to which omissions occurred in the reports obtained for a given institution can be ascertained by referring to the tabulation of the data utilized in the present study given in the preceding section.

<sup>12</sup> In an even number of cases the second of the two middle ranks was assigned.

<sup>13</sup> That is, a rank in the last half of the series as near the middle rank as possible in view of the number of omissions and the requirements of ties involving the median.

composites and extra-curricular activities, and also between college marks and extra-curricular activities, and in addition a reliability coefficient between the two measures of extra-curricular activities in each case, were calculated by the rank-difference method for the five institutions included in the study. In these calculations the customary procedure of correlating random halves of the data was followed, the appropriate alternate and reliability coefficients being subsequently combined in the formula for correction for attenuation in order to obtain the corrected coefficients for the various relationships investigated.<sup>14</sup>

Finally, the probable errors of the new reliability coefficient and the alternate coefficients involved in the correlations with extra-curricular activities were obtained by the routine procedures for this purpose used in the investigation.<sup>15</sup>

#### SECTION 4

##### THE PRESENTATION AND INTERPRETATION OF THE CORRELATIONAL RESULTS FOR EXTRA-CURRICULAR ACTIVITIES

The presentation and interpretation of the correlational results for extra-curricular activities included in this section is concerned with two series of coefficients: (1) coefficients of correlation between ratings in moral and intellectual traits or their composites and extra-curricular activities; and (2) coefficients of correlation between college marks and extra-curricular activities. The two series of coefficients specified will now be considered in order.

##### *Coefficients of Correlation between Ratings in Moral and Intellectual Traits or Their Composites and Extra- Curricular Activities*

Table XIX presents coefficients of correlation between ratings in moral and intellectual traits or their composites and extra-cur-

<sup>14</sup> It should be noted that the resulting coefficients in their report and interpretation were subjected to the same requirements as to reliability and consistency formulated for the correlational results obtained in the study of the correlation between ratings in moral and intellectual traits. Detailed rules governing the report and the interpretation of routine correlational results obtained for selected institutions will be found in Appendix II, Section 2.

<sup>15</sup> Described in the third section of Chapter XVII.

ricular activities. This table is of interest because it affords evidence as to the relation between moral and intellectual traits and an objective measure of social intelligence.

The table has two major divisions, which serve to differentiate the various coefficients according to the type of judges submitting ratings. These major divisions are designated as follows:

- A. Calculated from Ratings by Faculty Judges.
- B. Calculated from Ratings by Student Judges.

These two divisions of the table include the key number of the institution for the five selected institutions represented by faculty judges and the two selected institutions represented by student judges, the final grade assigned to the ratings by faculty or by student judges, the number of students retained as subjects in the investigation, the reliability coefficient for the objective measure correlated with its probable error, the alternate and the corrected coefficients calculated between ratings in moral and intellectual traits or their composites and extra-curricular activities, and the qualitative weight assigned to the coefficients for each institution in the compilation of correlational results.

The traits and the objective measure correlated in this series of coefficients for the ratings by the two types of judges are given below:

#### RATINGS BY FACULTY JUDGES

Morality in the Broadest Sense (*M*), Intellect as Shown in Studies (*IS*), Intellect as Shown in Activities Other than Studies (*IA*), and Composite of Intellectual Traits (*IS-IA*) with Extra-Curricular Activities (*ECA*).

#### RATINGS BY STUDENT JUDGES

Composite of Moral Traits (*U-R*), Intellect as Shown in Studies (*IS*), Intellect as Shown in Activities Other than Studies (*IA*), and Composite of Intellectual Traits (*IS-IA*) with Extra-Curricular Activities (*ECA*).

Of the resulting coefficients, the first in the case of ratings by both faculty and student judges are of significance in a consideration of the relation between moral traits and an objective measure of social intelligence, whereas the remaining coefficients in the case of both types of ratings are of significance in a consideration of the relation between intellectual traits and an objective measure of social intelligence.

The coefficients of correlation between ratings in moral and intellectual traits or their composites and extra-curricular activities presented in Table XIX afford very inconsistent evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There are five institutions represented in the coefficients calculated from ratings by faculty judges, and two institutions represented in the coefficients calculated from ratings by student judges.

(2) The final grades assigned to the ratings range from A to D in the case of ratings by faculty judges with an equal number of institutions in the highest and the lowest group, and from A to C in the case of ratings by student judges with a single institution in each group.

(3) The number of students retained as subjects ranges from 40 to 17 in the case of ratings by faculty judges, and from 63 to 17 in the case of ratings by student judges, with 37 as the median number in the former instance, and with the two extremes as the only numbers in the latter instance, and with 150 and 80, respectively, as the total numbers of students retained in the two instances.

(4) The reliability coefficients for the objective measure of social intelligence are high without exception, both in the case of ratings by faculty judges and in the case of ratings by student judges; moreover, the reliability coefficients are more than ten times their probable errors in all but one instance in the case of ratings by faculty judges, and in both instances in the case of ratings by student judges. In view of the greater subjectivity of the ratings for the intellectual trait denoting social intelligence, it is also of interest to observe by reference to Tables XIII and XIV that the reliability coefficients for the intellectual trait in question are lower than the corresponding reliability coefficients for the objective measure of social intelligence under consideration for four of the five institutions compared in the case of ratings by faculty judges, and for both of the institutions compared in the case of ratings by student judges.

(5) The alternate coefficients for the measures correlated, although at times widely divergent, meet the minimum standard of agreement required<sup>18</sup> in the case of fourteen of the seventeen pairs calculated from ratings by faculty judges for the five institutions con-

<sup>18</sup> If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

TABLE XIX  
COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN MORAL AND INTELLECTUAL TRAITS  
OR THEIR COMPOSITES AND EXTRA-CURRICULAR ACTIVITIES  
*A. Calculated from Ratings by Faculty Judges*

Key No. of Insti- tution	Final Grade Assigned to Ratings	No. of Students Retained as Subjects	Reliability Coefficients <sup>a</sup> with Probable Error	Alternate Coefficients <sup>b</sup>								Corrected Coefficients <sup>b</sup>				Qualitative Weight Assigned to Coefficients
				MIECA <sub>2</sub>	M <sub>2</sub> ECA <sub>1</sub>	ISIECA <sub>2</sub>	IS <sub>2</sub> ECA <sub>1</sub>	IAIECA <sub>2</sub>	IA <sub>2</sub> ECA <sub>1</sub>	IS-IAIECA <sub>2</sub>	IS-IA <sub>2</sub> ECA <sub>1</sub>	M ECA	IS ECA	IA ECA	IS-IA ECA	
20	A	40	.72±.05	.19	.27	.42	.48	.46	.56			.29	.59	.69		4
12	A	37	.78±.05	.46	.48	.27	.31	.50	.52			.61	.40	.69		4
16	C	17	.83±.06	.58	.19	.37	.08	.58	-.02	.56	.04	.40	.21	.41	.18	2
9	D	39	.93±.02	-.04	-.04	.13	-.19	.27	.44	.21	.10	-.07	-.04	.71	.21	1
19	D	17	.70±.10	.08	-.52	.08	-.29	.46	-.21			-.46	-.14	...		1

## B. Calculated from Ratings by Student Judges

KEY NO. OF INSTI- TUTION	FINAL GRADE ASSIGNED TO RATINGS	NO. OF STUDENTS RETAINED AS SUBJECTS	RELIABILITY COEFFICIENT <sup>a</sup> WITH PROBABLE ERROR	ALTERNATE COEFFICIENTS										CORRECTED COEFFICIENTS				QUALITATIVE WEIGHT ASSIGNED TO COEFFICIENTS
				ECA/ICA <sub>2</sub>		IS/ICA <sub>2</sub>		IA/ICA <sub>2</sub>		IS-IA/ICA <sub>2</sub>		IS-IA/ICA <sub>1</sub>		U-R/ICA	IS/ICA	IA/ICA	IS-IA/ICA	
				U-R/ICA <sup>a</sup>	U-R/ICA <sub>1</sub>	IS/ICA <sub>2</sub>	IS/ICA <sub>1</sub>	IA/ICA <sub>2</sub>	IA/ICA <sub>1</sub>	IS-IA/ICA <sub>2</sub>	IS-IA/ICA <sub>1</sub>							
9	A	63	.89±.02	-.10	-.23	-.06	-.02	.10	.31	.02	.15	-.23	-.05	.37	.08	4		
16	C	17	.83±.06	.68	.72	.44	.06	.23	-.10	.37	.10	.93	.20	.11	.27	2		

## KEY TO SYMBOLS

*ECA* Extra-Curricular Activities. *M* Morality in the Broadest Sense. *IS* Intellect as Shown in Studies. *IA* Intellect as Shown in Activities Other than Studies.  
*IS-IA* Composite of Intellectual Traits. *U-R* Composite of Moral Traits. *Subscript 1* First Half of Data. *Subscript 2* Second Half of Data.  
<sup>a</sup> Except in the case of Institution 9, the reliability coefficients for ratings in moral and intellectual traits and their composites utilized in calculating corrected coefficients, reported as usual to two places only, may be ascertained by consulting the appropriate entries for the institutions in question in Tables XIII and XVI in the case of ratings by faculty judges, and in Tables XIV and XVI in the case of ratings by student judges. It will be observed that the number of students retained as subjects in the calculation of these reliability coefficients corresponds to the number retained as subjects in the calculation of the coefficients reported above for the same institutions. In the case of Institution 9, reliability coefficients for the same groups of subjects as those represented in the coefficients reported above were calculated as follows:

Series of Ratings	No. of Students Retained as Subjects	Reliability Coefficients with Probable Errors			
		<i>M</i> <sub>1</sub> <i>M</i> <sub>2</sub>	<i>IS</i> <sub>1</sub> <i>IS</i> <sub>2</sub>	<i>IA</i> <sub>1</sub> <i>IA</i> <sub>2</sub>	<i>IS-IA</i> <sub>1</sub> <i>IS-IA</i> <sub>2</sub>
Ratings by Faculty Judges	39	.35±.10	.62±.07	.25±.11	.54±.08
Ratings by Student Judges	63	<i>U-R</i> <sub>1</sub> <i>U-R</i> <sub>2</sub>	<i>IS</i> <sub>1</sub> <i>IS</i> <sub>2</sub>	<i>IA</i> <sub>1</sub> <i>IA</i> <sub>2</sub>	<i>IS-IA</i> <sub>1</sub> <i>IS-IA</i> <sub>2</sub>
		.52±.07	.54±.06	.27±.08	.50±.07

<sup>b</sup> Alternate coefficients which correspond to omitted or italicized corrected coefficients, and likewise italicized corrected coefficients, are disregarded in subsequent discussion, and also (if pertinent) in the compilations of correlational results, because the data involved failed to meet the requirements as to reliability and consistency formulated in the course of the investigation (cf. Appendix II, Section 2).

cerned, and the eight pairs calculated from ratings by student judges for the two institutions concerned.

(6) The corrected coefficients for the measures correlated, although decidedly variable in the first case and extremely variable in the second case, tend in general to be marked for correlations with single moral or intellectual traits and to be low for correlations with ratings in combined intellectual traits in the case of ratings by faculty judges, but tend in general to be low or negligible for all correlations in the case of ratings by student judges, the highest results in both cases, however, being obtained for correlations between the intellectual trait denoting social intelligence and the objective measure of social intelligence, as shown by the following tabulation:

Traits Correlated	No. of Coeffi- cients <sup>a</sup>	Corrected Coefficients <i>Weighted Median or Mean</i> <sup>bc</sup>
A. CALCULATED FROM RATINGS BY FACULTY JUDGES		
Morality in the Broadest Sense ( <i>M</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	4	.41
Intellect as Shown in Studies ( <i>IS</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	5	.42
Intellect as Shown in Activities Other than Studies ( <i>IA</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	3	.67
Composite of Intellectual Traits ( <i>IS-IA</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	2	*.19
B. CALCULATED FROM RATINGS BY STUDENT JUDGES		
Composite of Moral Traits ( <i>U-R</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	2	*.16
Intellect as Shown in Studies ( <i>IS</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	2	*.03
Intellect as Shown in Activities Other than Studies ( <i>IA</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	2	*.28
Composite of Intellectual Traits ( <i>IS-IA</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	2	*.14

<sup>a</sup> All italicized coefficients reported in Table XIX are excluded in this tabulation.

<sup>b</sup> The method of weighting used in the tabulation is qualitative, the weight applied to each coefficient corresponding to the final grade assigned to the ratings submitted by faculty or student judges for the institution in question.

<sup>c</sup> A weighted mean is distinguished from a weighted median by an asterisk.



(7) The qualitative weights assigned to the coefficients range from 4 to 1 in the case of ratings by faculty judges, and from 4 to 2 in the case of ratings by student judges, according to the final grades assigned to the ratings, with an equal number of the highest and the lowest weights in the former instance, and one of each of the two weights indicated in the latter instance.

A cross-comparison of the corrected coefficients for ratings in moral traits by faculty and student judges correlated with extra-curricular activities, reported in Table XIX, and the corresponding corrected coefficients for ratings in moral traits correlated with ratings in intellectual traits in the case of both faculty and student judges, reported in Tables XIII and XVI, respectively, affords the following information as to the effect of the halo error upon the relation between moral character and social intelligence found in the investigation:<sup>17</sup>

(1) In the case of ratings by faculty judges a change from a subjective to an objective measure of social intelligence apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.10$ , the second of these coefficients being consistently lower than the first for the three institutions represented in the comparison.<sup>18</sup>

(2) In the case of ratings by student judges this change apparently has an indifferent effect upon the degree of relationship, since the mean difference between the contrasted coefficients is only  $-.055$ , the second of these coefficients being lower than the first for one of the two institutions represented in the comparison and higher than the first for the other institution.<sup>19</sup>

<sup>17</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from  $+1.00$  to  $-1.00$  was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed, italicized coefficients reported in Tables XIII and XIX, however, being disregarded because of the unsatisfactory character of the data from which they were derived. In the case of ratings by faculty judges the simple median of these differences, and in the case of ratings by student judges the simple mean, is reported.

<sup>18</sup> The corrected coefficients involved in the comparison for ratings by faculty judges in the order in which they are used in the discussion are (1) the coefficients calculated between Morality in the Broadest Sense and Intellect as Shown in Activities Other than Studies (*M IA*), reported in Table XIII, and (2) the coefficients calculated between Morality in the Broadest Sense and Extra-Curricular Activities (*M ECA*), reported in Table XIX.

<sup>19</sup> The corrected coefficients involved in the comparison for ratings by student judges in the order in which they are used in the discussion are

It is of interest to note that the finding of a lower degree of relationship between moral character and social intelligence in the case of ratings by faculty judges, when ratings in an intellectual trait indicating social success are replaced by an objective measure of social success, is in accord with the result to be expected in view of the assumed effect of the halo error upon the correlation between ratings in moral and intellectual traits. At the same time, it is evident that an indifferent finding in the case of ratings by student judges, although not actually discordant, fails to add assurance. On the other hand, the genuineness of the influence of the halo error is further confirmed by a similar finding in the case of both faculty and student judges for the study of the correlation between ratings in moral and intellectual traits and college marks reported in the preceding chapter.<sup>20</sup> Notwithstanding, the numerical results of the comparison cannot be construed as an indication of the magnitude of the halo error in the case of Ratings as to Social Intelligence for the two types of judges concerned, in view of the indifferent result for ratings by student judges in the present study, and in view of the many factors involved in the correlations, including a larger number of student judges than of faculty judges and the use of a composite of moral traits in the case of ratings by student judges, and also presumably including more accurate knowledge of student participation in college affairs on the part of student judges as compared with faculty judges.

In summary, then, it may be said that coefficients of correlation between ratings in moral and intellectual traits or their composites and extra-curricular activities point to a direct and marked relation between moral character and intelligence among college

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(1) the coefficients calculated between Composite of Moral Traits and Intellect as Shown in Activities Other than Studies (*U-R IA*), reported in Table XVI, and (2) the coefficients calculated between Composite of Moral Traits and Extra-Curricular Activities (*U-R ECA*), reported in Table XIX.

It will be noted that a change in the type of relation is involved in one instance.

<sup>20</sup> It will be recalled that further proof of the influence of the halo error in the case of Ratings as to Social Intelligence contrasted with Reports of Extra-Curricular Activities, which is in substantial agreement with the finding for the two series of results first compared reported in this chapter, was offered in a preceding division of the research in connection with the interpretation of Table IX in Chapter IX.

students in the United States if ratings by faculty judges are taken as the basis of decision, and to a direct and low relation between these two qualities if ratings by student judges are taken as the basis. Although the evidence presented in the former instance is considerably more adequate than the evidence presented in the latter instance, in view of the fact that the individual coefficients calculated from ratings by faculty judges are low or actually negligible and negative in two out of four instances, and that one of the two individual coefficients calculated from ratings by student judges is low and negative, the presence of a marked relation can scarcely be regarded as established. Nevertheless, the probability that the relationship in question is actually marked rather than low is increased by the fact that this result is doubtless affected by the various extraneous and selective factors that were analyzed in the case of coefficients of correlation between ratings in moral and intellectual traits, with this important exception that the halo error ceases to be prominent when an objective measure of social intelligence replaces the corresponding series of ratings in intellectual traits. In consequence, therefore, the total effect of these factors in the present instance is possibly to lower the degree of relationship found.

*Coefficients of Correlation between College Marks and  
Extra-Curricular Activities*

Table XX presents coefficients of correlation between college marks and extra-curricular activities. Although this table does not afford any evidence as to the relation between moral and intellectual traits, it is nevertheless of interest, since the relationship reported is of considerable importance from the standpoint of college administration.

The table includes the key number of the institution for the five selected institutions represented, the number of students retained as subjects in the investigation, the reliability coefficients for the two objective measures correlated with their probable errors, and the alternate and the corrected coefficients calculated between college marks and extra-curricular activities.

The objective measures correlated in this series of coefficients are given below:

College Marks (*CM*) with  
Extra-Curricular Activities (*ECA*).

TABLE XX  
COEFFICIENTS OF CORRELATION BETWEEN COLLEGE MARKS AND EXTRA-CURRICULAR ACTIVITIES

KEY NO. OF INSTITUTION	NO. OF STUDENTS RETAINED AS SUBJECTS	RELIABILITY COEFFICIENTS <sup>a</sup> WITH PROBABLE ERRORS		ALTERNATE COEFFICIENTS <sup>b</sup>		CORRECTED COEFFICIENT
		CM <sub>1</sub> CM <sub>2</sub>	ECM <sub>1</sub> ECM <sub>2</sub>	CM <sub>1</sub> ECM <sub>2</sub>	CM <sub>2</sub> ECM <sub>1</sub>	
9	63	.83±.03	.89±.02	.04	—	.01
20	40	.91±.02	.72±.05	.54	.42	.59
12	37	(.84)	.78±.03	—	.00	—
16	17	.74±.09	.83±.00	.00	.13	.08
19	17	.84±.06	.70±.10	.04	—	.05

KEY TO SYMBOLS

CM College Marks.

ECM Extra-Curricular Activities.

Subscript 1 First Half of Data.

Subscript 2 Second Half of Data.

<sup>a</sup> The reliability coefficient in parentheses was supplied because only one measure of college marks was available for the institution in question. The figure supplied represents the weighted mean of the reliability coefficients for the five four-year institutions with two measures of college marks, the weight applied to the individual coefficients being the number of students retained as subjects for the institution concerned.

<sup>b</sup> Since only one measure of college marks was available for Institution 12, as indicated in the preceding footnote, the alternate coefficients reported for this institution are CM<sub>1</sub>ECM<sub>2</sub> and CM<sub>2</sub>ECM<sub>1</sub>, respectively.

The resulting coefficient is of significance in a consideration of the relation between objective measures of abstract and social intelligence.

The coefficients of correlation between college marks and extra-curricular activities reported in Table XX with one exception show practically a zero correlation between abstract and social intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There are five institutions represented in the coefficients calculated from objective measures of intellectual traits.

(2) The number of students retained as subjects ranges from 63 to 17, with 37 as the median number, and with 174 as the total number of students retained.

(3) The reliability coefficients for the two measures are high without exception; moreover, the reliability coefficients are more than ten times their probable errors<sup>21</sup> in all but two instances. This is of course a natural outcome in view of the objectivity of the measures involved.

(4) The alternate coefficients for the measures correlated, in no instance widely divergent, meet the minimum standard of agreement required<sup>22</sup> in the case of the five pairs for the five institutions concerned.

(5) The corrected coefficients for the measures correlated, although marked in one instance, tend in general to be negligible, as shown by the following tabulation:

Traits Correlated	No. of Coeffi- cients	Corrected Coefficient <i>Weighted Median</i> <sup>a</sup>
College Marks ( <i>CM</i> ) with Extra-Curricular Activities ( <i>ECA</i> ) . . . . .	5	.02

<sup>a</sup> The method of weighting used in the tabulation is quantitative, the weight applied to each coefficient corresponding to the number of students retained as subjects for the institution in question.

In summary, then, it may be said that coefficients of correlation between college marks and extra-curricular activities indicate that superior scholastic achievement and active participation in student

<sup>21</sup> Probable errors are given only for the reliability coefficients calculated from the original data in routine fashion.

<sup>22</sup> If these coefficients and the corresponding corrected coefficients were to be considered in the interpretation or included in the compilations of results (cf. Appendix II, Section 2).

affairs are rarely found together among college students in the United States. From the standpoint of college administration, however, the exceptional finding that scholastic and social success may be associated to a marked degree is the more significant, and calls for an analysis of the factors contributing to this result. An examination of the catalogue for the institution distinguished by the exceptional finding seems to indicate that at least three factors are involved: (1) the type of institution, a liberal arts college controlled by one of the more austere Protestant denominations, (2) the type of students enrolled, presumably predominantly German in extraction, and (3) the method of supervision of student affairs, consisting in a cooperative government association in which both faculty and students worked together.

## CHAPTER XXII

### A SYNTHESIS OF THE INVESTIGATION OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS

THE justification for a synthesis of the investigation presented in Part II is identical in principle with the justification for the syntheses of the investigations included in the other parts of the research. It lies in the opportunity for formulating general conclusions as to the relation between moral and intellectual traits, and hence as to the relation between morality and intellect, afforded by a summary of the findings of the studies included. Accordingly, this chapter provides a synthesis of the investigation of the relation between moral and intellectual traits.

The synthesis presented in the three sections of this chapter includes an explanation of the method of combining coefficients of correlation for college students, a compilation of the correlational results of studies of the relation between moral and intellectual traits, and a comparison between a quantitative and a qualitative method of weighting the correlational results of the investigation.

#### SECTION I

##### AN EXPLANATION OF THE METHOD OF COMBINING COEFFICIENTS OF CORRELATION FOR COLLEGE STUDENTS<sup>1</sup>

Although the method of combining coefficients of correlation for college students does not contravene the procedures employed in the case of other types of groups, an explicit rephrasing and amplification in terms of the needs of the present division of the research is desirable.

<sup>1</sup> An explanation of the method of combining coefficients of correlation for all types of subjects, which applies only to the syntheses of the investigations included in the research, will be found in Chapter XXXI.

The procedure for combining the correlational results for college students called first for a tabular review of the investigation of the relation between moral and intellectual traits confined to the results bearing upon the problem of the relation between moral character and intelligence, then for a series of tabulations summarizing the results as presented in the individual tables, and lastly for a compilation of the correlational results included in the tabular review, which should consistently provide for a classification according to types of evidence, but should otherwise be concentrated as far as the heterogeneity of the data and the function served by the coefficients combined permitted. The procedure thus involved the calculation of quantitatively or qualitatively weighted quartile or percentile points or weighted means, as appropriate, for both uncorrected and corrected coefficients for the several types of evidence and the one type of group and country represented, and also for the smaller groupings of the data as presented in the original tables.

The rules followed in combining coefficients of correlation for college students for presentation in the different series of combined results differed slightly, and were governed by the limitations of tabular space and the subsequent interpretive use of the combined results. These rules may be formulated as follows:

1. For report in the tabular review of the investigation, calculate the weighted medians or means<sup>2</sup> of the uncorrected and corrected coefficients required for a balanced synopsis of results, in the manner indicated below:

- a. In calculating the weighted median or mean of the alternate coefficients, multiply the mean coefficient representing each pair of alternate coefficients by the corresponding number of cases.

- b. In calculating the weighted median or mean<sup>2</sup> of the corrected coefficients, multiply each coefficient by the corresponding number of cases for one series of results, and by the qualitative weights assigned to the coefficients in the evaluation of the data for another series of results.

2. For report in the series of tabulations summarizing the results for individual tables, calculate the weighted quartile points or weighted means<sup>3</sup> of the corrected coefficients required for an

<sup>2</sup> A weighted mean rather than a weighted median was calculated when the number of coefficients was only two.

<sup>3</sup> The weighted median (or mean) was calculated in every case, the weighted lower and upper quartile points being reported only for the most important results, including pooled results for various traits.



adequate interpretation of results, using the qualitative weights described above for correlations between moral and intellectual traits or their composites, intercorrelations between moral traits, and correlations between moral and intellectual traits and objective measures of intelligence, and the quantitative weights described above for cross-correlations between faculty and student judges and correlations between objective measures of intelligence.

3. For report in the compilation of correlational results, calculate the weighted quartile and percentile points<sup>4</sup> of the uncorrected and corrected coefficients required in a synthesis of the investigation, using both the quantitative and the qualitative weights described above.

## SECTION 2

### A COMPILATION OF THE CORRELATIONAL RESULTS OF STUDIES OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS

Table XXI presents a compilation of the correlational results of studies of the relation between moral and intellectual traits.<sup>5</sup>

The table summarizes the correlational results for the different types of evidence, the one type of group, the single country, and the one type of coefficient represented in the investigation, the particular information called for in this compilation including the total population, the number of coefficients, and certain weighted quartile or percentile points for the rank-difference coefficients of correlation combined, these results being given in turn for the mean of the alternate coefficients, weighted quantitatively, and for the corrected coefficients, weighted both quantitatively and qualitatively.

The compilation of the correlational results of studies of the relation between moral and intellectual traits presented in Table XXI may be interpreted briefly as follows:

(1) The correlation between moral and intellectual traits as found in the case of College Students, United States, is generally positive, but extremely variable.

<sup>4</sup> The weighted lower and upper quartile points as well as the weighted median were calculated in each case because the number of coefficients did not fall below six, the weighted 10- and 90-percentile points also being reported provided the number of coefficients was ten or more.

<sup>5</sup> A frequency distribution of the coefficients included in this compilation of correlational results for Part II will be found in Appendix IV, Section 2.

TABLE XXI  
A COMPILATION OF THE CORRELATIONAL RESULTS OF STUDIES OF THE RELATION BETWEEN  
MORAL AND INTELLECTUAL TRAITS

NON-DELINQUENT													
CORRELATIONAL RESULTS													
RANK-DIFFERENCE COEFFICIENTS OF CORRELATION													
TYPE OF EVIDENCE	TYPE OF GROUP AND COUNTRY	TOTAL POPULATION <sup>a</sup>	NO. OF COEFFICIENTS <sup>b</sup>	MEAN OF ALTERNATE			CORRECTED						
				WEIGHTED QUANTILE OR PERCENTILE POINTS <sup>c</sup>			WEIGHTED QUANTILE OR PERCENTILE POINTS <sup>c</sup>						
				QUANTITATIVE			QUANTITATIVE						
				MEDIAN	Q1 AND Q3	P10 AND P90	MEDIAN	Q1 AND Q3	P10 AND P90	MEDIAN	Q1 AND Q3	P10 AND P90	
Ratings as to Intelligence Ratings as to Abstract Intelligence	College Students United States	1,570	43	.32	.25 ... .39	-.03 ...+.52	.61	.45 ... .72	-.04 ...+.82	.56	.39 ... .70	-.05 ...+.81	
Ratings as to Social Intelligence	College Students United States	1,467	40	.29	.14 ... .43	.04 ... .57	.68	.39 ... .83	.09 ... .94	.66	.37 ... .82	.02 ... .93	
Ratings as to Abstract and Social Intelligence	College Students United States	296	9	.36	.21 ... .42		.60	.34 ... .81		.61	.32 ... .80		

Reports of Educational Status Reports of Educational Achievement	College Students United States	277	10	.43	.16 ... .48	.00 ... .51	.58	.21 ... .64	.00 ... .86	.56	.22 ... .63	.00 ... .77
Reports of Extra-Curricular Activities	College Students United States	213	6	.20	-.16 ... +.45		.25	-.21 ... +.60		.29	-.09 ... +.62	

<sup>a</sup> The number tabulated is the gross number of cases represented by all the coefficients (whether the mean of the alternate or the corrected coefficients) opposite the number in question, regardless of any duplication that may have occurred in the subjects for these coefficients.

<sup>b</sup> Since the raw uncorrected coefficients used in this investigation were calculated between alternate halves of the data, and since a mean of the resulting alternate coefficients was used to represent each pair of alternate coefficients in combining the correlational results of the investigation, the figure given represents the actual number of these mean coefficients; and at the same time represents the actual number of the corresponding corrected coefficients, barring however pertinent coefficients excluded in the interpretations of the individual tables and in the combinations of correlational results because the data involved failed to meet certain requirements as to reliability and consistency formulated in the course of the investigation.

<sup>c</sup> The method of weighting used in the compilation was quantitative in the case of the mean of the alternate coefficients, and both quantitative and qualitative in the case of the corrected coefficients. The quantitative weight applied to each coefficient corresponded to the number of cases represented by the coefficient in question, this number being taken as the frequency of that coefficient in the calculation of the weighted quartile or percentile points. The qualitative weight applied to each coefficient, on the other hand, corresponded to the final grade assigned to the ratings submitted by the faculty or the student judges for the institution in question, this value in turn being taken as the frequency of that coefficient in the calculation of the weighted quartile or percentile points.

(2) If the results actually found without correction for attenuation due to chance inaccuracies in the original measures are taken as the basis of interpretation, the degree of correlation revealed by the three minor types of evidence representing Ratings as to Intelligence tends to be rather low or fairly low, that revealed by Reports of Educational Achievement tends to be somewhat marked, and that revealed by Reports of Extra-Curricular Activities again tends to be fairly low.

(3) If the results corrected for attenuation due to chance inaccuracies in the original measures are taken as the basis of interpretation,<sup>6</sup> the degree of correlation revealed by the three minor types of evidence representing Ratings as to Intelligence tends to be decidedly marked, and that revealed by Reports of Educational Achievement tends to be well marked, whereas that revealed by Reports of Extra-Curricular Activities tends to remain fairly low.

By further reference to the table it will be observed that the central tendencies of the uncorrected coefficients with a single exception fall below .40, whereas the central tendencies of the corrected coefficients with one exception fall above .50, and with two exceptions reach .60 or above. This difference in the results suggests an appreciable or a noticeable effect upon the degree of relationship of chance inaccuracies in the original measures.

In conclusion, therefore, it may be stated that the evidence as to the relation between moral character and intelligence presented in Part II of the research is fairly clear and definite, and indicates that a direct and marked relation exists between morality and intellect among college students in the United States.

In comment upon this conclusion, however, it should be pointed out that practically all of the data considered in this investigation are for college seniors presumably of good moral character, with the result that most or all of the subjects were selected in respect to both intelligence and character; and that, in addition, various other selective or extraneous factors, notably the halo error, have had their part in either lowering or raising the degree of relationship found.<sup>7</sup> Since the total effect of these factors has probably

<sup>6</sup> Although this interpretation of the corrected coefficients is based on the quantitative weighting of results, in order to make it comparable with the preceding interpretation of uncorrected coefficients and with the corresponding interpretations of the compilations of correlational results which are given in each division of the research, with one very slight modification it also applies to the results obtained by a qualitative method of weighting.

<sup>7</sup> Attention has already been called to the influence of such factors in the detailed interpretations of the individual tables in the preceding chapters. The matter is further discussed in a consideration of various factors which

been to raise the results obtained, the true relation between morality and intellect in accurately measured restricted groups of the type investigated is quite possibly lower than these results indicate. At the same time, it is hardly probable that the relation is low. Hence the conclusion is apparently justified that there is a direct and marked relation between morality and intellect among college students in the United States.

### SECTION 3

#### A COMPARISON BETWEEN A QUANTITATIVE AND A QUALITATIVE METHOD OF WEIGHTING THE CORRELATIONAL RESULTS OF THE INVESTIGATION

The necessary data for the present comparison are immediately available in Tables X and XXI, which respectively present a tabular review of the investigation of the relation between moral and intellectual traits, and a compilation of the correlational results of studies of the relation in question. The figures required for this comparison are reproduced in the tabulation on the following page.<sup>8</sup>

A consideration of these figures providing a comparison between a quantitative and a qualitative method of weighting discloses the following facts:

(1) If the detailed figures subsumed under the various types of evidence be taken as the basis of comparison, the central tendencies of the coefficients obtained by the two methods of weighting are within .07 of each other in the case of four of the five types of evidence represented.

(2) If the summary figures given for the various types of evidence be taken as the basis of comparison, the central tendencies of the coefficients obtained by the two methods of weighting are within .05 of each other in every instance, and the mean difference between the results weighted quantitatively and qualitatively is but  $-.008$  if

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affect the correlational results of the research, including an analysis of the effect of different types of subjects, an analysis of the effect of different types of evidence, types of groups, countries, and types of coefficients, and an analysis of the effect of chance inaccuracies in the original measures, to which Chapter XXXII will be devoted.

<sup>8</sup> Additional figures permitting a comparison of certain weighted quartile or percentile points for each type of evidence will be found in Table XXI.

Type of Evidence	Total Popu- lation <sup>a</sup>	No. of Coeffi- cients	Corrected Coefficients	
			<i>Weighted Median or Mean<sup>b</sup></i>	<i>Quantitative Qualitative</i>
Ratings as to Intelli- gence				
Ratings as to Abstract Intelligence . . . . .	1570	43	.61	.56
	498	14	.67	.66
	920	25	.55	.49
	152	4	.71	.70
Ratings as to Social Intelligence . . . . .	1467	40	.68	.66
	365	10	.65	.60
	926	25	.74	.73
	176	5	.75	.72
Ratings as to Abstract and Social Intelli- gence . . . . .	296	9	.60	.61
	144	5	.47	.54
	152	4	.81	.80
Reports of Educational Status				
Reports of Educa- tional Achievement.	277	10	.58	.56
	236	8	.60	.60
	41	2	*.05	*.00
Reports of Extra-Curric- ular Activities . . . . .	213	6	.25	.29
	133	4	.28	.41
	80	2	*.02	*.16

<sup>a</sup> The number tabulated is the gross number of cases represented by all the coefficients opposite the number in question, regardless of any duplication that may have occurred in the subjects for these coefficients.

It will be observed that the figures in italics in the present tabulation represent totals for the results subsumed under them.

<sup>b</sup> A weighted mean is distinguished from a weighted median by an asterisk.

the signs of the differences are regarded, and only .028 if these signs are disregarded.

It is therefore evident that it is a matter of small importance whether a quantitative or a qualitative method of weighting is employed in the interpretation of results.

PART III

AN INVESTIGATION OF THE RELATION BETWEEN  
CONDUCT AND INTELLIGENCE





## CHAPTER XXIII

### AN EXPLANATION OF THE METHOD OF MEASURING MORALITY EMPLOYED IN STUDIES OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE

THE principal considerations in the general organization of subject matter in Part III were the need for orientation in the division of the research concerned with the relation between conduct and intelligence, the necessity for a detailed account of the several studies undertaken in attacking this problem, and the desirability of relating the subject matter presented in this division of the research with that presented in preceding divisions. Accordingly, the present chapter supplies an explanation of the method of measuring morality employed in studies of the relation between conduct and intelligence, whereas the succeeding chapters offer a tabular review of the investigation of the relation between conduct and intelligence, a detailed account of the three complementary studies included in the investigation under the heading *Studies of the Correlation between Scores in Conduct and Intelligence*, and a synthesis of the investigation of the relation studied.

The explanation given in the two sections of this chapter describes the construction of the measures of morality utilized in the investigation of the relation between conduct and intelligence, and the determination of the reliability of the measures constructed.

#### SECTION I

##### THE CONSTRUCTION OF THE MEASURES OF MORALITY UTILIZED IN THE INVESTIGATION OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE

In the introduction to Part II an ideal approach to the study of the relation between morality and intellect was stated to be

one which would utilize adequate objective tests of both qualities. The present discussion is concerned with the construction of the measures of morality utilized in the investigation of the relation between conduct and intelligence, devised after the investigation reported in Part II was initiated, and relatively objective in character. Their use in connection with group and individual intelligence tests, at that time but recently developed, made possible an investigation of the relation between morality and intellect which approaches the ideal set forth. An account of the construction of relatively objective measures of morality and a brief description of the two measures of morality utilized in the investigation follow.

*An Account of the Construction of Relatively Objective  
Measures of Morality*

In the early stages of the research the author had under consideration the construction of a peopled morality scale somewhat analogous to the Thorndike Drawing Scale or the Hillegas Composition Scale, in which actual or fictitious accounts of the lives of people who ranged in degree of morality from the saint to the moral imbecile should take the place of samples of drawing or of composition. Possible sources for a peopled morality scale readily suggest themselves. Eulogies and the lives of non-contemporary saints might furnish descriptions of sample individuals for the upper end of the scale; history, biography, fiction, and personal observation would doubtless provide descriptions of such individuals for the intermediate ranges; and confessions of morbid literary geniuses, life histories of notorious criminals, case studies of delinquents, and records of the criminal court should supply descriptions of such individuals for the lower ranges. Thereafter, ratings by qualified experts as to the "general merit" in morality displayed by the sample individuals would make possible the assignment of scale values to each description.

At the time, some preliminary consideration of the problems involved in the construction of such a scale was undertaken, and a number of descriptions of sample persons were made out. A little work of this kind, however, revealed the desirability of more or less standardizing the material to be included in the descriptions.<sup>1</sup>

<sup>1</sup> It may be observed that the informal method first proposed and the systematic plan later suggested for the construction of peopled morality scales

There thus came to mind the possibility of listing a formidable array of stimuli which would be representative of the situations in which these sample individuals might conceivably be placed, and of cataloguing the various responses which they might make to such stimuli. It is evident that after suitable lists of stimuli and responses had been made out, any number of sample individuals of varying degrees of goodness could have been constructed by varying the situations and the responses, and by covering over the rather bony skeleton of such mechanically constructed individuals with the flesh and blood of literary English. Subsequently the sample persons could be graded in morality in the manner indicated above.<sup>2</sup>

Although peopled morality scales of a somewhat different character were constructed during the course of the research,<sup>3</sup> the two measures of morality actually utilized in this investigation were not of this type, and found their impetus in a practical necessity lying outside the research. On the other hand, the development of these instruments into measurement scales as such owed its inspiration to the needs of the research itself.

The practical necessity referred to may be briefly described. In the Horace Mann Elementary School a plan for reporting

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roughly parallel two plans actually followed in the construction of scales in school subjects. Thus in the construction of the earlier drawing and handwriting scales it was not required that the drawings be of the same object nor that the samples of handwriting follow the same copy; in the preparation of the later scales, however, the object to be drawn or the selection to be written was specified.

<sup>2</sup>It will be noted that both of the plans here suggested differ materially from the Scott Rating Scale, which first came to the writer's attention late in 1916 when she was outlining to Dr. Scott her proposed procedure for constructing a peopled morality scale. The Scott Rating Scale provides definitions of traits, and then requires the prospective judge to supply his own scale men for each trait in the persons of individuals he has known who exemplify in varying degrees the trait in question. This method possesses the advantage of vital meaning to the judge, but since the scale men for different judges are never the same except by chance it can hardly fail to suffer from a large element of subjectivity. Indeed, a careful study by Rugg, reported in the article "Is the Rating of Human Character Practicable?" (183), clearly establishes the importance of the halo error in ratings of Army officers made by this method, and shows the need for at least three independent ratings on this scale.

<sup>3</sup>The measures referred to are the Horace Mann School *Self-Measurement Scales for School Citizens*, which will be described in some detail in a later footnote. These charts in a sense represent the fruition of the plans for a peopled morality scale which should be developed in a systematic fashion.

habits and attitudes desirable for good citizenship, devised by Mrs. Siegfried M. Upton and the present author, was instituted in the fall of 1918. This plan provided that the teachers report to the parents quarter by quarter the habits and attitudes of each pupil which were unusually well developed, which needed careful training, and in which improvement had been marked. In order to supply a guide as to the habits and attitudes which might be included in these reports, and at the same time to enable the teachers to follow a uniform terminology in reporting, a chart of "Habits and Attitudes Desirable for Good Citizenship in the Elementary School" was constructed as a part of the report plan. The citizenship chart<sup>4</sup> supplied specific information as to the numerical importance of the habits and attitudes listed, and was thus immediately adaptable for measurement purposes. Accordingly, this citizenship chart constituted a measure of morality suitable for use in the present investigation.

The citizenship chart constructed to meet the need described above was subsequently extensively revised on the basis of suggestions received from many sources. This revised chart<sup>5</sup> attempted "an analysis of conduct in terms of the concrete and specific habits and attitudes which should characterize a child who is taking his part as a good citizen in an elementary school democracy," and at the same time provided "definite information with regard to the relative importance of the items . . . listed" (cf. 203, p. 39).<sup>6</sup>

<sup>4</sup> Presented in the article entitled "A Scale for Measuring the Importance of Habits of Good Citizenship," in which it is designated Chart II (cf. 203, pp. 61-65).

<sup>5</sup> Also presented in the article cited in the preceding footnote, in which it is designated Chart I (cf. 203, pp. 54-60).

<sup>6</sup> The scope of the revised chart is apparent from the classificatory headings utilized. They were as follows:

#### THE GOOD CITIZEN:

Takes Care of His Health	Stands for Fair Play
Keeps a Good Posture	Is Courageous
Is Orderly	Is Honest and Truthful
Exercises Thrift	Is Trustworthy
Is Prompt	Has a Sense of Civic Responsibility
Thinks Clearly and Purposefully	Is Obedient
Has a Sense of Humor	Is Generous
Is Refined	Is Courteous and Considerate
Is Characterized by Helpful Initiative	Is Coöperative
Is Self-Reliant	Is Broadminded

The revised citizenship chart was itself hardly adaptable for measurement purposes because of its length. Nevertheless, it included the material necessary for the construction of eight equivalent short citizenship scales,<sup>7</sup> which were subsequently de-

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Exercises Self-Control	Is Loyal
Lives Up to the Traditions of	Has a Fine Sense of Appreciation
Good Sportsmanship	and Seeks to Express It

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(cf. 203, pp. 54-60).

<sup>7</sup> The revised form of the Upton-Chassell Citizenship Chart also served as the basis for two other measures of good citizenship. The first of these measures is styled *A Test of Ability to Weigh Foreseen Consequences*. This test was constructed by the author with the assistance of Mrs. Ella B. Chassell, and is presented in the article entitled "A Test and Teaching Device in Citizenship for Use with Junior High School Pupils" (134). A further account of the test is to be found in an article by Clara F. Chassell, Ella B. Chassell, and Laura M. Chassell, entitled "A Test of Ability to Weigh Foreseen Consequences" (135). This test consists of a series of stories presenting problems for good citizens, and includes an analysis of the possible consequences of an action described in the story with provision for evaluating these consequences and reaching a decision as to the problem in the light of the consequences. A citizenship score is assigned on the test on the basis of the evaluation of the consequences and the decisions reached.

The second of these measures bears the title *Horace Mann School Self-Measurement Scales for School Citizens*. These self-measurement scales represent a rearrangement and adaptation of the material used in the revised citizenship chart and the short citizenship scales, made by the author with the assistance of Dr. Laura Chassell Toops; and are available through the Division of Pupil Adjustment of the Horace Mann School. These scales present verbal pictures of the different levels of citizenship which may be attained by good and poor school citizens in terms of desirable and undesirable habits and attitudes of corresponding grades of importance. In their construction two equivalent hierarchy charts were built up from the 187 items of the revised chart and 5 additional items used in the short scales. The plan followed required that the 192 items be phrased negatively as well as positively in order to represent both desirable and undesirable habits and attitudes of school citizenship, and that the items be distributed in alternation into two forms, one-half of the items stated positively being combined with the other half of the items stated negatively and *vice versa*, so that both forms might incorporate the entire number of items. For the sake of ease in rating, in the case of each hierarchy chart the lower levels of school citizenship, comprising the habits and attitudes assigned to groups 1, 2, 3, 4, 5, and 6 on the basis of their relative importance, have been segregated in a scale for use in the lower grades, and the upper levels of school citizenship, comprising the habits and attitudes assigned to groups 7, 8, 9, and 10 on the same basis, have been similarly segregated in a scale for use in the upper grades, minor adjustments being made to equalize the number of items for the four scales. Since the items of lesser importance are mainly habits, the alternative scales for use in the lower grades are designated *Habit Scale A* and *Habit Scale B*, respectively; on the other hand, since the items of greater importance are mainly attitudes, the alternative scales for use in the upper grades are designated *Attitude Scale A* and *Attitude Scale B*, respectively.

vised by the authors of the chart in collaboration with Miss Laura M. Chassell.<sup>8</sup> These citizenship scales, in turn, constituted a measure of morality suitable for use in the present investigation.

The early form of the citizenship chart, and likewise the citizenship scales, yield a conduct score as the measure of morality.<sup>9</sup>

*A Brief Description of the Two Measures of Morality  
Utilized in the Investigation*

For a fuller understanding of the measures of morality utilized in the investigation, a brief description of the two measures is provided, first for the citizenship scales, and secondly for the citizenship chart.

The Citizenship Scales

The Chassell-Upton Citizenship Scales utilized in this investigation include eight equivalent short scales derived from the revised form of the Upton-Chassell Citizenship Chart. Each one of the eight short scales contains twenty-four items selected from the entire chart<sup>10</sup> and arranged in the order of their importance according to the numerical values appearing at the right of the items on the revised chart. These values represent the consensus of opinion as to their relative importance of seventy-four qualified judges, who rated them on a scale of 10 from the standpoint of

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As a graphic reminder of their significance, each of the levels of citizenship defined by the ten groups of items is taken to represent a type of pupil designated in the scales, who is presumably characterized by a majority of the habits and attitudes descriptive of that level of citizenship. Finally, by a modification of the rating device used in the citizenship scales, provision is made for rating oneself or another person qualitatively with reference to the various habits and attitudes listed in the form selected, and for assigning the individual thus rated a school citizenship score in accordance with the habits and attitudes which are thought to characterize him.

<sup>8</sup> Presented in the article entitled "Short Scales for Measuring Habits of Good Citizenship" (136).

<sup>9</sup> Justification for the use of a conduct score as a measure of morality is found in the following statement by Dewey, quoted by Beery: "Character and conduct are, morally, the same thing, looked at inwardly and then outwardly." (126, p. 207)

<sup>10</sup> Since the revised chart contains only 187 items, in making up the short scales it was necessary to duplicate five of the items in order to provide 24 items for each scale. In the scales as printed in the article already referred to the duplicated items are replaced by others adjudged to be of similar importance.

their importance as essential elements in democratic citizenship in the case of elementary school children.

The instructions for rating pupils by means of the scales provide for the rating of a pupil by underlining one of the numbers 0, 1, 2, and 3 preceding each item, weighting the scores on the three sections of the scale by the use of appropriate multipliers, and obtaining the mean of the scores derived from two scales as the pupil's conduct score. The meaning of the numbers preceding the items, as given in these instructions, is as follows:

- 0 indicates almost complete absence of the habit or attitude in question.
- 1 indicates below average attainment.
- 2 indicates above average attainment.
- 3 indicates practically perfect attainment.

The maximum score on any of these scales, and also the maximum mean score on two scales, is 378 points.<sup>11</sup>

### The Citizenship Chart

The early form of the Upton-Chassell Citizenship Chart utilized in this investigation includes one hundred habits and attitudes<sup>12</sup> in respect to which pupils are to be rated, classified under three main headings, as follows:

- I. In Relation to Self and Personal Belongings.
- II. In Relation to Others and the Belongings of Others.
- III. In Relation to Studies and Other Activities.

The items in the chart are in each case accompanied by a numerical value which corresponds to a theoretically perfect score for the item in question, as determined by the judgments of one hundred educators, who evaluated the items from the standpoint of their relative importance on a scale of 1,000.<sup>13</sup>

The instructions for rating pupils by means of the citizenship

<sup>11</sup> The mimeographed directions for using the scales supplied to the teachers differed only in unessential respects from the directions for marking the scales, as printed in the article presenting the scales, already cited (cf. 136, p. 56).

<sup>12</sup> Inclusive of 90 sub-headings and 10 headings under which there are no sub-headings.

<sup>13</sup> In some instances the numerical values given on the record sheet used by the teachers varied by one or two points from the corresponding figures given on the chart as printed in the article already referred to, since in the latter instance a somewhat more refined statistical procedure was used in determining the values of the sub-headings.

chart provide for the assignment to a given pupil item by item of the credit to which he is entitled, in comparison with the perfect score for the respective items, according to the extent to which he has made the habit in question his own. A perfect score on the entire chart is 1,000 points.<sup>14</sup>

## SECTION 2

### THE DETERMINATION OF THE RELIABILITY OF THE MEASURES CONSTRUCTED

The determination of the reliability of the measures constructed in the manner described proceeded hand in hand with their use in the investigation, but involved two different procedures. Accordingly, the reliability of the citizenship scales as determined by the comparable test method and of the citizenship chart as determined by the split test method will be reported.

#### *The Reliability of the Citizenship Scales as Determined by the Comparable Test Method*

The reliability of the citizenship scales was determined by correlating the scores on paired scales for many pupils in a number of private and public schools, the same teacher rating in each case on the two scales. This method resulted in the reliability coefficients for paired citizenship scales in single and in combined grades or classes which may now be presented.

#### Reliability Coefficients for Paired Citizenship Scales in Single Grades or Classes

The following quotation from the original article which presented the citizenship scales gives the information previously available as to their reliability, since it reports the only reliability coefficients for these scales which have been published up to this time. It will be noted that these reliability coefficients are in every case

<sup>14</sup>The instructions for rating pupils by means of the chart in the form used by the teachers have not been printed, but a further description of the method of rating will be found in the article presenting the chart, already cited (cf. 203, p. 43). It is of interest to note that, although supplementary instructions submitted to the teachers provided for utilizing symbols instead of numerical ratings if desired, all the teachers who rated pupils on the chart assigned numerical ratings only.



for paired citizenship scales in single grades or classes. These coefficients are of especial interest, since the schools for which results are cited in the quotation are identical with two of the schools included in the investigation reported in this division of the research;<sup>15</sup> while more than half of the scores on the citizenship scales compared were utilized in the investigation.

"The coefficients of correlation,  $r$ , computed between the ratings made by teachers on two or more scales, are given in the following table:

<i>Scales</i>	<i>r</i>	<i>Grade or Class</i>	<i>No. of Pupils</i>
A and B	.86	Grade V, Private School A	30
	.92	Grade II Ab, Public School A	37
	.97	Grade III Ab, Public School A	41
C and D	.86	Grade V, Private School A	30
	.93	Grade II Bc, Public School A	29
E and F	.90	Grade V, Private School A	30
	.82	Ungraded I, Public School A	17
	.92	Ungraded V, Public School A	16
G and H	.96	Grade V, Private School A	30
	.81	Ungraded VI, Public School A	15
Average	.895		

"As is evident from the table, all the correlations obtained show a close relationship between ratings made on the various scales. None of the correlations fall below .80, and six of the ten correlations between the paired scales are .90 or above, the average correlation being .895. The reliability of the scales thus compares very favorably with that found for other types of equivalent tests. It is of interest to note that correlations of .95 and .94, not given in the table, found between the average of the first four scales and the average of the second four, and between the average of the first two scales and the average of the eight scales, respectively, in the case of the fifth grade of Private School A, are no higher than those found in two instances between the paired scales. So far as the practical use of the scales is concerned these results indicate, then, that teachers marking their pupils on two scales may expect their ratings to be in general agreement. Moreover, they will probably secure almost as reliable a measure of their pupils from the use of the two scales as from the use of a larger number."<sup>16</sup> (136, p. 67)

<sup>15</sup> The schools designated by key letters in the table given in the quotation may be identified by consulting the key to the schools included in the investigation of the relation between conduct and intelligence, which will be found in Appendix III, Section I.

<sup>16</sup> The following footnote, appended to the text in the original source, is also of interest: "The comparison with results for paired scales will seem even more favorable if it be borne in mind that the correlation between the first two scales and the average of the eight scales is unduly high, owing to

Reliability Coefficients for Paired Citizenship Scales  
in Combined Grades or Classes

It is of interest to compare the information with reference to the reliability of the scales contained in the foregoing quotation with certain information not previously available, which may now be given. Accordingly, Table XXII presents reliability coefficients for paired citizenship scales in combined grades or classes.<sup>17</sup>

These coefficients are of even greater interest than the reliability coefficients previously given, not only because the schools for which results are cited in the table include all the schools represented in the present investigation of the relation between conduct and intelligence,<sup>18</sup> but also because the scales, the grade groupings, the teachers, and the pupils represented by these coefficients are the same as those represented in part of one study and throughout another study in this investigation.

The table specifies for certain private and public school groups the scales on which ratings were assigned, the reliability coefficient obtained by the product-moment method, the grades or classes combined, the number of teachers assigning the ratings, and the number of pupils rated. The arrangement of the table thus corresponds to the arrangement of the table presenting reliability coefficients for paired citizenship scales in single grades or classes, the column giving the number of teachers, however, having been added.<sup>19</sup>

An inspection of the reliability coefficients for paired citizenship scales in combined grades or classes presented in Table XXII and a comparison of these coefficients with the reliability coefficients for single grades or classes, previously given, discloses the following facts:

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the fact that the data for the eight scales include the data for the two with which they are being compared." (136, p. 67)

<sup>17</sup> Additional reliability coefficients for paired citizenship scales for substantially the same subjects as those represented by the reliability coefficients reported herewith, but arranged mainly in lower- and upper-grade groups rather than in the combined grades or classes indicated, will be found in Appendix III, Section 2, B. An additional reliability coefficient for 107 cases in Private School A will be found in Table XXIV in Chapter XXVI.

<sup>18</sup> A key to the schools included in the investigation will be found in Appendix III, Section 1.

<sup>19</sup> It is of interest to note that all but two of the teachers and nearly all the pupils represented in the table previously given are also represented in Table XXII (cf. Appendix III, Section 2, A).

TABLE XXII

RELIABILITY COEFFICIENTS FOR PAIRED CITIZENSHIP SCALES IN COMBINED GRADES OR CLASSES<sup>a</sup>

SCALES	r	GRADES OR CLASSES	NO. OF TEACHERS	NO. OF PUPILS
A, B, C, F, H	.83	Grades I—V, Private School A	5	91
C, D, G, H	.92	Grades I—V-VI, Private Schools B, C, and D	6	50
A, B, C, D, G, H	.96	Grades IB—IIIA, Opportunity Classes IIA—IIIB (low), IIB—IIIB (Terman), Public School A	9	305
E, F	.91	Opportunity Classes VB—VIA (Terman), VIIA (Terman), Public School A	2	46
E, F, G, H	.75	Ungraded Classes I—IV, Public School A	4	59
A, B, C, D, E, F, G, H	.90	Classes for all grades of feeble-minded pupils, Public School B	23 <sup>b</sup>	278
Average	.88			

<sup>a</sup> It is of interest to note that the 1 additional reliability coefficient for paired citizenship scales in combined grades or classes recorded in Table XXIV and the 6 additional coefficients of this type recorded in Appendix III, Section 2, B are included within the range of the 5 highest coefficients tabulated above.

<sup>b</sup> One of the classes combined in this instance was rated by 2 teachers, one of whom was the teacher of one of the other groups rated.

(1) The reliability coefficients for paired citizenship scales in combined grades or classes are all high, 4 of the 6 coefficients reported being .90 or above.

(2) Similarly, the reliability coefficients for paired citizenship scales in single grades or classes are all high, 6 of the 10 coefficients reported being .90 or above.

(3) The mean of the 6 coefficients for combined grades or classes is .88, whereas the mean of the 10 coefficients for single grades or classes is .895, the weighted means<sup>20</sup> in both cases being .91.<sup>21</sup>

It may therefore be concluded that the citizenship scales utilized in this investigation constitute a highly reliable measure, whether the consistency of the ratings of one teacher assigned to her own pupils in a single grade or class, or the consistency of the ratings of several teachers assigned to their respective pupils in a number of combined grades or classes, is taken as the criterion.

*The Reliability of the Citizenship Chart as Determined by the Split Test Method*

The reliability of the citizenship chart was determined by correlating the scores on the two halves of the test for certain pupils

<sup>20</sup> Obtained by multiplying each coefficient by its respective number of cases, and dividing the sum of the products by the total number of cases.

<sup>21</sup> The mean of the reliability coefficients reported in Appendix III, Section 2, B, representing substantially the same subjects arranged mainly in lower- and upper-grade groups, is .89, and the weighted mean is again .91; while the additional reliability coefficient reported in Table XXIV for Private School A is also .91.

in one private school, one teacher usually supplying the ratings for the entire chart. In applying this method the reliability coefficient for one-half of the citizenship chart was first obtained by correlating the sum of the scores on the odd items and the sum of the scores on the even items for forty-four pupils in Private School A,<sup>22</sup> and found to be .96. The reliability coefficient for the entire chart was then derived by the application of the Spearman-Brown formula for obtaining the reliability coefficient of a test determined from the scores on the two halves, and found to be .98.<sup>23</sup>

This reliability coefficient is extremely high, and would seem to indicate that the citizenship chart constitutes fully as stable a measure as the citizenship scales, and possibly an even more consistent measure than these. However that may be, it is evident that both of the measures of morality developed in this investigation are characterized by high reliability. This statement is nevertheless subject to the qualification that the magnitude of reliability coefficients calculated from rating scales by the two methods employed is doubtless dependent in part upon the operation of the halo error, affecting the rating of individual items whether combined in a single measuring instrument or distributed over two or more scales. For this reason the measures of morality utilized in the investigation can be classed as only relatively objective.

<sup>22</sup> It will be noted that this school is identical with one of the schools for which results are cited in Table XXII. The following school grades were represented in the present instance: Grades II (Teacher b), III, Open Air III, III-IV, Open Air IV, and V-VI (cf. Appendix III, Section 2, A).

<sup>23</sup> It is of interest to compare this result with the coefficient of .95, previously reported, which was obtained between the average of the first four scales and the average of the second four scales for 30 pupils in Grade V, Private School A. In obtaining the result for the scales derived from Chart I, (omissions in the ratings, and the duplication of 5 items, as explained in an earlier footnote, being overlooked) 96 items were correlated with a second 96 items, since each of the eight scales contains 24 items. In obtaining the result for Chart II, on the other hand, (omissions in the ratings being again overlooked) 50 items were correlated with a second 50, since the entire chart contains 100 items, and the formula specified above was then applied to determine the reliability coefficient for the total 100 items.

## CHAPTER XXIV

### A TABULAR REVIEW OF THE INVESTIGATION OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE

AS IN the case of Part II, the consistent utilization throughout this volume of a uniform tabular method of report, adapted to the different types of studies presented, at this point calls for a tabular review of the results of the original investigation which is reported in this division of the research. Such a representation of the investigation as a whole provides in convenient and comparable form the evidence as to the relation between conduct and intelligence, and thus as to the relation between morality and intellect, afforded by the studies included. Accordingly, Table XXIII presents a tabular review of the investigation of the relation between conduct and intelligence.<sup>1</sup>

The table contains the routine information required in a tabular review of correlational studies in non-delinquent groups, and the distinctive information appropriate to the particular coefficients tabulated, including in this case the number of coefficients and the single coefficient or the weighted median, as appropriate, for the product-moment coefficients of correlation reviewed, this result being given in turn for the mean of the alternate or the raw and the corrected zero order coefficients, and for the corrected first order coefficients.

The major and minor types of evidence as to the relation between conduct and intelligence contributed by the data tabulated are listed following the table.

<sup>1</sup> A frequency distribution of the coefficients showing the degree of relationship found between moral character and intelligence, including the most significant correlational results presented in Part III, which are identical with those represented in this review, will be found in Appendix IV, Section 2. In this distribution the results for the three complementary studies are combined in a single analysis for the one type of evidence represented, and may be identified by the numbers of the tables as given in the analysis.

TABLE XXIII  
A TABULAR REVIEW OF THE INVESTIGATION OF THE RELATION  
BETWEEN CONDUCT AND INTELLIGENCE

NON-DELINQUENT									
AUTHORITY	DATE OF INVESTIGATION	DATE OF PUBLICATION	GROUP	No. of CASES	MEASURES		PRODUCT-MOMENT COEFFICIENTS OF CORRELATION		
					MORAL CHARACTER	INTELLIGENCE	NO. OF COEFFICIENTS*	ZERO ORDER	FIRST ORDER
								MEAN OF ALTERNATE OR RAW	CORRECTED
								SINGLE COEFFICIENT OR WEIGHTED MEDIAN	SINGLE COEFFICIENT OR WEIGHTED MEDIAN
Chassell (Part III)	1919	1935	SCHOOL CHILDREN <i>United States</i> Pupils in Grades III—VI, Private School A <sup>c</sup>	107	RESULTS OF INTELLIGENCE TESTS				
					RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE				
					Conduct score calculated from ratings by teacher on 2 Chassell-Upton Citizenship Scales	Score on Pressey Mental Survey—Scale No. 1	1	.52	.57

1918	Pupils in Grades I—V-VI, Private School A	62	Conduct score calculated from rating by teacher on early form of Upton-Chassell Citizenship Chart	Intelligence quotient as determined by Stanford Revision of Binet-Simon Scale	1	.32	.33
1919	Pupils in Private Schools A, B, C, and D, and Public Schools A and B <sup>d</sup>	829	Conduct score calculated from ratings by teacher on 2 Chassell-Upton Citizenship Scales	Intelligence quotient as determined by Stanford Revision of Binet-Simon Scale	6	.18	.18
1919	Pupils in Private Schools A, B, C, and D, and Public Schools A and B <sup>d</sup>	829	Conduct score calculated from ratings by teacher on 2 Chassell-Upton Citizenship Scales	Mental age as determined by Stanford Revision of Binet-Simon Scale	6	.24	.24
							.23 <sup>e</sup>

<sup>a</sup> Since the main uncorrected coefficients used in this investigation, with a single exception, were calculated from the two halves of the data for one measure and the undivided data for the other measure, and since a mean of the resulting alternate coefficients was taken as the most satisfactory figure for comparative purposes, the figure given represents the actual number of these mean coefficients plus the 1 raw coefficient, and at the same time represents the actual number of the corresponding corrected coefficients.

<sup>b</sup> The method of weighting used throughout the tabular review was quantitative. The weight applied to each coefficient corresponded to the number of cases represented by the coefficient. In question, this number being taken as the frequency of that coefficient in the calculation of the weighted median.

<sup>c</sup> A key to the schools included in the investigation of the relation between conduct and intelligence is given in Appendix III, Section I.

<sup>d</sup> The grades and classes represented by these pupils were as follows: Regular Grades and Opportunity Classes: Private School A, Grades I—V (91 pupils); Private School B, Grades III—V—VI (22 pupils); Private School C, Grades I and II (45 pupils); Private School D, Grade III (13 pupils); and Public School A, Grades IB, IIA, IIB, and IIIA, and Opportunity Classes IIA—IIIB (low), IIB—IIIB (Terman), VB—VIA (Terman), and VIIA (Terman) (351 pupils); Ungraded and Binet Classes: Public School A, Ungraded Classes I—IV (59 pupils); and Public School B, classes for all grades of feeble-minded pupils (278 pupils).

<sup>e</sup> The variable held constant is chronological age.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence.

The following type of group is represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: School Children.

The following country is likewise represented by the studies reviewed in the table:

NON-DELINQUENT GROUPS: United States.

The tabular review of the investigation of the relation between conduct and intelligence presented in Table XXIII affords consistent evidence of a positive correlation between moral character and intelligence, and hence of a positive correlation between morality and intellect.

A further interpretation of the evidence as to these relationships will follow the presentation and the compilation of the correlational results as given in succeeding chapters.



# *STUDIES OF THE CORRELATION BETWEEN SCORES IN CONDUCT AND INTELLIGENCE*

## CHAPTER XXV

### A PRELIMINARY SURVEY OF THE STUDIES OF THE CORRELATION BETWEEN SCORES IN CONDUCT AND INTELLIGENCE

THIS chapter and the three succeeding chapters are devoted to a detailed account of the three complementary studies included in the investigation of the relation between conduct and intelligence. The present chapter affords a preliminary survey of the studies of the correlation between scores in conduct and intelligence, while the remaining chapters report in order a study of the correlation between conduct score and mental survey score, a study of the correlation between conduct score and intelligence quotient, and a study of the correlation between conduct score and mental age.

The preliminary survey offered in the two sections of this chapter includes an outline of the three studies, and a summary of the data obtained from private and public schools.

#### SECTION I

##### AN OUTLINE OF THE THREE STUDIES

The three studies of the correlation between scores in conduct and intelligence represent three methods of approach to the problem of the relation between conduct and intelligence.

Study 1, presented in Chapter XXVI, considers the correlation between conduct score and group intelligence test score. In this study the coefficients of correlation reported are between conduct score and mental survey score. The measures employed were (1) the Chassell-Upton Citizenship Scales, and (2) the Pressey Mental Survey—Scale No. 1.

Study 2 and Study 3, presented in Chapters XXVII and XXVIII, consider the correlation between conduct score and individual intelligence test score. In Study 2 the coefficients of correlation reported are between conduct score and intelligence quotient.<sup>1</sup> The measures employed in the two parts of this study were as follows: in Study 2a, (1) the early form of the Upton-Chassell Citizenship Chart, and (2) the Stanford Revision of the Binet-Simon Scale; in Study 2b, (1) the Chassell-Upton Citizenship Scales, and (2) the Stanford Revision of the Binet-Simon Scale. In Study 3 the coefficients of correlation reported are between conduct score and mental age with chronological age constant. The measures employed were identical with those utilized in Study 2b.

## SECTION 2

### A SUMMARY OF THE DATA OBTAINED FROM PRIVATE AND PUBLIC SCHOOLS

The data utilized in the investigation were contributed by four private schools and two public schools.<sup>2</sup> It may be noted that the most important considerations operating in the selection of these schools were (1) the availability of Stanford Revision intelligence examination results for the pupils in one or more grades or classes, and (2) the possibility of obtaining conduct ratings for the tested pupils.<sup>3</sup>

The names and the geographical locations of the six schools, classified according to type of school, follow:

<sup>1</sup> It is recognized that, strictly speaking, the intelligence quotient is a ratio rather than a score. For the sake of convenience, however, the term *score* is applied to it.

<sup>2</sup> Data contributed by a fifth private school included conduct ratings by the teacher on but one citizenship scale, and hence were not utilized in the investigation.

<sup>3</sup> Although practically all the pupils in these schools for whom intelligence test results and conduct ratings were available served as subjects in one or more of the three studies, the records of individual pupils were occasionally excluded because the data were deficient or unsatisfactory in some respect, or because it proved desirable to limit the sex or the range in chronological age of a given group; also, the records of the pupils in several classes were entirely eliminated because too few of the pupils in these classes had been both tested reliably and rated to justify their inclusion (cf. Appendix III, Section 2, A and B).

PRIVATE: Horace Mann School, New York City; Social Motive School, New York City; Scarborough School, Scarborough, New York; Riverdale Country School, Riverdale-on-Hudson, New York.

PUBLIC: Public School 64, Manhattan, New York City; Public Schools, Newark, New Jersey.

These schools are designated by the words *Private* and *Public* with the appropriate key letters in the presentation of results throughout the investigation.<sup>4</sup>

The data utilized in the three studies are briefly summarized below:<sup>5</sup>

Study 1. Scale conduct scores and mental survey scores for 107 normal and bright pupils in Private School A.<sup>6</sup>

Study 2a. Chart conduct scores and intelligence quotients for 62 dull, normal, and bright pupils in Private School A.

Study 2b. Scale conduct scores and intelligence quotients for 492 borderline, dull, normal, and bright pupils in Private Schools A, B, C, and D, and Public School A, and 337 feeble-minded pupils in Public Schools A and B.

Study 3. Scale conduct scores, mental ages, and chronological ages for the 492 borderline, dull, normal, and bright pupils and the 337 feeble-minded pupils specified for Study 2b.

In anticipation of the results for the three studies, it may be said that, in spite of the two measures of conduct and the three measures of intelligence utilized, evidence of a positive correlation between conduct and intelligence was found in the three studies, the first study, however, showing a considerably higher degree of relationship than the other two.

<sup>4</sup> A key to the schools included in the investigation of the relation between conduct and intelligence will be found in Appendix III, Section 1.

<sup>5</sup> Detailed information regarding the data utilized in the three studies and supplementary coefficients of correlation calculated between scores in conduct and intelligence, both for single grades or classes and for combined grades or classes, will be found in Appendix III, Section 2, A and B, and statistical information derived from the frequency distributions of the measures employed in the three studies, in Appendix III, Section 3.

<sup>6</sup> An analysis of the extent to which the subjects in Private School A duplicated one another in the three studies discloses the following facts:

(1) A comparison of the 107 pupils included in Study 1 with the 62 pupils included in Study 2a and with the 91 pupils included in Study 2b and Study 3 shows 7 identical pupils in the first case and 49 identical pupils in the second case.

(2) A comparison of the 62 pupils included in Study 2a with the 91 pupils included in Study 2b and Study 3 shows 7 identical pupils.

As already indicated, the subjects for Study 2b and Study 3 were identical.

## CHAPTER XXVI

### A STUDY OF THE CORRELATION BETWEEN CONDUCT SCORE AND MENTAL SURVEY SCORE

A STUDY of the correlation between conduct score and mental survey score presented in the three sections of this chapter includes a description of the data and the subjects represented in the study employing mental survey score as the measure of intelligence, an explanation of the procedures required in determining the correlation with mental survey score, and the presentation and interpretation of the correlational results for mental survey score.

#### SECTION I

##### A DESCRIPTION OF THE DATA AND THE SUBJECTS REPRESENTED IN THE STUDY EMPLOYING MENTAL SURVEY SCORE AS THE MEASURE OF INTELLIGENCE

The present study of the correlation between scores in conduct and intelligence, designated Study I, considers the correlation between conduct score and group intelligence test score, and employs mental survey score as the measure of intelligence.

In order to study the correlation between conduct score and mental survey score, coefficients of correlation were calculated between conduct score derived by the use of the Chassell-Upton Citizenship Scales, and mental survey score determined by means of the Pressey Mental Survey—Scale No. 1.

The data utilized in the calculations consisted of scale conduct scores and mental survey scores for 107 pupils in Grades III to VI, inclusive, in Private School A. One class in each of the grades indicated supplied data, and practically the entire population of these classes served as subjects in the study.<sup>1</sup>

<sup>1</sup> The distribution of the subjects grade by grade is given in Appendix III, Section 2, A.

The pupils in the classes supplying data for the study represented a selected group in respect to heredity and environment. The classes included both boys and girls.

The circumstances in which the measures employed in this study became available were as follows: (1) during the second semester of the school year 1918-19 the teachers of the classes described rated their pupils on two of the citizenship scales named above, and the resulting conduct scores on the two scales afforded the measure of conduct required; (2) within a month or two of the time in which the ratings in conduct were assigned, the author, who was the school psychologist at that time, gave the group intelligence test specified above throughout the third, fourth, fifth, and sixth grades in the private school concerned, and the mental survey scores obtained by this means provided the measure of intelligence required.

## SECTION 2

### AN EXPLANATION OF THE PROCEDURES REQUIRED IN DETERMINING THE CORRELATION WITH MENTAL SURVEY SCORE

The first procedure employed was necessitated by the fact that the teachers did not rate all of their pupils with respect to every item on the citizenship scales.<sup>2</sup> The procedure consisted in the assignment of a reasonable credit for omitted items, and the subsequent calculation of the conduct score in terms of all of the items on the scales in question. Accordingly, the required steps<sup>3</sup> were taken pupil by pupil and scale by scale in those instances in which omissions in the ratings had occurred.

The measures were then ready for use in the calculation of the coefficients of correlation required in the correction for attenuation formula selected. This formula was as follows:

$$r_{\infty} = \frac{r_{12}}{\sqrt{r_{11}}\sqrt{r_{22}}} \quad (\text{cf. 154, p. 204}).$$

<sup>2</sup> The omissions in the ratings for the pupils included in this study were relatively unimportant.

<sup>3</sup> The steps in assigning credit for omitted items and in the subsequent calculation of the conduct score for the citizenship scales are specified in Appendix III, Section 4, A.

Since two measures of conduct were available, the following coefficients were calculated by the product-moment method for the entire group included in the study:<sup>4</sup>

1. Scale conduct score 1 with mental survey score.
2. Scale conduct score 2 with mental survey score.
3. Scale conduct score 1 with scale conduct score 2.

In order to supply the figure  $r_{12}$  required in the numerator of the formula, as a further step the arithmetic mean of the two coefficients obtained between conduct score and mental survey score was taken.

Since the reliability coefficient  $r_{11}$  required in the denominator for the citizenship scales had been calculated, the remaining step was the obtaining of the reliability coefficient  $r_{211}$  required in the denominator for mental survey score. The necessary figure was estimated by the present author for the entire group included in the study from information concerning the reliability of the Pressey Mental Survey Scales—"Cross-Out" Tests, and by inference concerning the reliability of the Pressey Mental Survey—Scale No. 1 (the test used in determining mental survey score), supplied by one of the authors of the tests named.<sup>5</sup> Stated briefly,

<sup>4</sup> Since two of four coefficients of correlation between average scale conduct score and mental survey score obtained for single grades were less than three times their probable errors (cf. Appendix III, Section 2, A), a single coefficient for the entire group was thought preferable to coefficients for single grades.

<sup>5</sup> Professor S. L. Pressey of the Ohio State University, who supplied the information referred to in two personal letters. The first of these letters, dated June 10, 1927, read in part as follows:

"We developed no duplicate forms of this scale, and we were very suspicious (still are) regarding adequacy of determining reliability by correlation of odd and even items. . . .

"Any estimate of reliabilities under the circumstances is, of course, next to impossible. I can say this, however, that all our tabulations show a very unusually low amount of overlapping from one grade to another. Since unreliability tends to increase overlapping this suggests not only validity but reliability. Our even-odd reliability on the cross-out tests, which show much more overlapping, was .82. It would seem reasonable to infer, then, that even-odd item reliability on the survey scale No. 1 was still higher."

The second of these letters, dated October 12, 1927, is given in part below:

"The reliability coefficient for the cross-out scale . . . was the estimated reliability for the whole scale, obtained by use of the Spearman Brown formula . . . from analysis of results from 86 seventh grade pupils. . . .

"I would estimate the scale number one reliability to be very definitely higher than the cross-out, since it has twice as many items, requires about twice as long to give, and shows very much less overlapping from grade to grade."

the procedure followed in making this estimate mainly took into account the relative lengths of the two tests named, but also considered the relative amount of overlapping of the tests, and the comparative heterogeneity and reading ability of the group included in the study and the group for which data were supplied.<sup>6</sup>

As soon as this reliability coefficient had been estimated, the required corrected coefficient was computed in routine fashion.

Finally, the probable errors of the unestimated reliability coefficients and the alternate coefficients were determined by reference to a table of P.E.*r* values,<sup>7</sup> and the probable error of the corrected coefficient was calculated by means of an appropriate formula.<sup>8</sup>

### SECTION 3

#### THE PRESENTATION AND INTERPRETATION OF THE CORRELATIONAL RESULTS FOR MENTAL SURVEY SCORE

The presentation and interpretation of the correlational results for mental survey score included in this section is concerned with a single series of coefficients: coefficients of correlation between conduct score and mental survey score. The series of coefficients specified will now be considered.

\* Stated in more detail, this procedure was based principally on the Spearman-Brown formula giving the effect on reliability of lengthening a test, namely,

$$r_x = \frac{Nr}{1 + (N-1)r} \text{ (cf. 144, p. 269);}$$

and involved the substitution in the numerator and the denominator of the formula of the figure 2, indicating that the length of survey scale No. 1 was twice that of the cross-out tests, and of the reliability coefficient for the cross-out tests, given as .82 by Pressey, by which means a figure of .90 was obtained. Thereupon, this figure was arbitrarily raised to .93, in view of the smaller degree of overlapping observed for the former test in comparison with the latter, and the greater heterogeneity of Grades III—VI, represented in Study 1, in comparison with Grade VII, represented by the group on the basis of which information as to reliability was supplied, the further fact also being taken into consideration that the two factors named are offset to a certain extent by the superior reading ability presumably characteristic of the higher grade.

<sup>7</sup> The particular table used for this purpose was the one prepared by Toops and Miner (197).

<sup>8</sup> The particular formula employed was the shortened form of Formula 161 given by Kelley (154, p. 209), but preceded by the constant required when the P.E. rather than the  $\sigma$  is desired.

*Coefficients of Correlation between Conduct Score  
and Mental Survey Score*

Table XXIV presents coefficients of correlation between conduct score and mental survey score. This table is of interest because it affords evidence as to the relation between conduct and intelligence based on data in which a group test was employed as the measure of intelligence.

The table includes the key name of the school for the one school represented, the school grades supplying data and the number of pupils who served as subjects in the investigation, the reliability coefficients for the measures correlated with the probable error for the measure of conduct, and the alternate and the corrected coefficients calculated between conduct score and mental survey score with their respective probable errors.

The measures correlated in the present instance are given below :

Scale Conduct Score (SCS) with  
Mental Survey Score (MSS).

The resulting coefficient is of significance in a consideration of the relation between conduct and intelligence.

The coefficients of correlation between conduct score and mental survey score presented in Table XXIV afford confirmatory evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts :

(1) There is one private school represented in the coefficients calculated from mental survey scores.

(2) The school grades supplying data range from III to VI.

(3) The total number of pupils who served as subjects was 107.

(4) The reliability coefficients for the two measures are both high; furthermore, the probable error for the measure of conduct<sup>o</sup> is negligible.

(5) The alternate coefficients for the measures correlated are extremely close, differing from each other by only .02, while both of the coefficients are more than ten times their probable errors in magnitude.

(6) The corrected coefficient for the measures correlated, which

<sup>o</sup> No probable error is given for the measure of intelligence, since the reliability coefficient in this case was estimated.



TABLE XXIV  
COEFFICIENTS OF CORRELATION BETWEEN CONDUCT SCORE AND MENTAL SURVEY SCORE

KEY NAME OF SCHOOL	SCHOOL GRADES SUPPLYING DATA	NO. OF PUPILS WHO SERVED AS SUBJECTS	RELIABILITY COEFFICIENTS WITH PROBABLE ERROR FOR MEASURE OF CONDUCT		ALTERNATE COEFFICIENTS <sup>a</sup> WITH PROBABLE ERRORS		CORRECTED COEFFICIENT WITH PROBABLE ERROR
			SCS <sub>1</sub> SCS <sub>2</sub>	MSS <sub>1</sub> MSS <sub>2</sub> <sup>b</sup>	SCS <sub>1</sub> MSS	SCS <sub>2</sub> MSS	
Private A	III, IV, V, VI	107	.91±.01	.93	.53±.05	.51±.05	.57±.05

## KEY TO SYMBOLS

SCS Scale Conduct Score.

MSS Mental Survey Score.

Subscript 1 First Measure.

Subscript 2 Second Measure.

<sup>a</sup> Statisticians may be interested in considering in connection with the alternate coefficients given in the above table, the raw coefficients calculated between average scale conduct score and mental survey score for single grades, presented in Appendix III, Section 2, A. Because of the greater restriction in range of the single grade groups, the raw coefficients for the single grades may be expected to be lower than the mean of the alternate coefficients for the combined grades, and they are in fact lower than this mean in three instances and equal to it in the fourth. It is of interest to note that the 4 coefficients referred to confirm the evidence afforded by the coefficient reported above of a direct relation between conduct and intelligence.

<sup>b</sup> Estimated from information concerning the reliability of a similar test.

is in turn more than ten times its probable error, is marked, as shown by the following tabulation, which is presented for the sake of conformity with the several correlational results of the two succeeding studies:

Measures Correlated	No. of Coeffi- cients	Corrected Coefficient <i>Single Coefficient</i>
Scale Conduct Score (SCS) with Mental Survey Score (MSS) . . . . .	1	.57

A critical examination of this corrected coefficient with reference to various factors which may affect the degree of relationship found discloses further facts of interest, as follows:

(1) The subjects were all pupils in a private school from which the lower levels of intellectual ability and serious cases of conduct disorder were presumably excluded, and were thus undoubtedly selected with respect to both moral character and intelligence.

(2) The class enrollment of the subjects represented only the upper primary and intermediate grades, with a consequent restriction in range in respect to both school grade and chronological age.

In summary, then, it may be said that coefficients of correlation between conduct score and mental survey score point to a direct and marked relation between moral character and intelligence among school children in the United States. Nevertheless, this result is doubtless affected by certain selective factors which presumably tend to lower the degree of relationship found.

## CHAPTER XXVII

### A STUDY OF THE CORRELATION BETWEEN CONDUCT SCORE AND INTELLIGENCE QUOTIENT

A STUDY of the correlation between conduct score and intelligence quotient presented in the three sections of this chapter includes a description of the data and the subjects represented in the study employing intelligence quotient as the measure of intelligence, an explanation of the procedures required in determining the correlation with intelligence quotient, and the presentation and interpretation of the correlational results for intelligence quotient.

#### SECTION I

##### A DESCRIPTION OF THE DATA AND THE SUBJECTS REPRESENTED IN THE STUDY EMPLOYING INTELLIGENCE QUOTIENT AS THE MEASURE OF INTELLIGENCE

The present study of the correlation between scores in conduct and intelligence, designated Study 2, in common with the study reported in the next chapter, considers the correlation between conduct score and individual intelligence test score, but, unlike the study referred to, employs intelligence quotient as the measure of intelligence.

In order to study the correlation between conduct score and intelligence quotient, coefficients of correlation were calculated between conduct score derived (*a*) by the use of the early form of the Upton-Chassell Citizenship Chart, and (*b*) by the use of the Chassell-Upton Citizenship Scales; and intelligence quotient determined by means of the Stanford Revision of the Binet-Simon Scale.

For Study 2a the data utilized in the calculations consisted of chart conduct scores and intelligence quotients for sixty-two pupils

in Grades I to V-VI, inclusive, in Private School A. Only tested pupils in the grades indicated served as subjects in the study.<sup>1</sup>

As in the case of Study 1, the pupils in the classes which supplied data for the study represented a selected group in respect to heredity and environment. However, an unusual proportion were considered problem cases by their teachers.<sup>2</sup> The classes included both boys and girls.

The circumstances in which the measures employed in this part of this study became available were as follows: (1) in the summer or fall of 1918 teachers in the school indicated rated certain of their pupils of the preceding school year on the citizenship chart named above, the rule followed in selecting these pupils being that they should have been tested for the first time by means of the Stanford Revision during the school year referred to, and the resulting conduct scores afforded the measure of conduct required; (2) during the school year in question the author, who was the school psychologist throughout this period, had given the individual intelligence test specified above to a considerable number of pupils in the private school concerned, including the pupils later selected to serve as subjects in the present study, and the intelligence quotients obtained by this means provided the measure of intelligence required.

For Study 2b the data utilized in the calculations consisted of scale conduct scores and intelligence quotients for 492 pupils in the regular grades and the opportunity classes in four private schools and one public school, and 337 pupils in the ungraded classes in the same public school and in the special schools and classes for feeble-minded children in a city school system, as indicated in detail on the opposite page. Practically the entire population of these classes served as subjects in the study.<sup>3</sup>

The social composition of these groups is apparent from the following quotation, taken from the article which presented the

<sup>1</sup> The distribution of the subjects grade by grade is given in Appendix III, Section 2, A.

<sup>2</sup> This statement is based on the fact that a considerable number of the subjects had been given the intelligence test at the request of their teachers. This was true to a less extent, however, in the case of the second grade pupils, for in this instance all of the pupils in these classes were being tested during the school year in question.

<sup>3</sup> The distribution of the subjects grade by grade is given in Appendix III, Section 2, A.

Key Name of School	School Grades or Classes	No. of Pupils
REGULAR GRADES AND OPPORTUNITY CLASSES		
Private A	Grades I, II, III, IV, V .....	91
Private B	Grades III, IV, V-VI .....	22
Private C	Grades I, II .....	15
Private D	Grade III .....	13
Public A	Grades IB, IIA, IIB, IIIA; Opportunity Classes IIA-IIB (low), IIB-IIIB (Ter- man <sup>a</sup> ), VB-VIA (Terman), VIIA (Ter- man) .....	351
UNGRADED AND BINET <sup>b</sup> CLASSES		
Public A	Ungraded Classes I, II, III, IV .....	59
Public B	Classes for all grades of feeble-minded pupils .....	278

<sup>a</sup> The name used to designate classes for bright children.

<sup>b</sup> The name used to designate special schools and classes for feeble-minded children.

citizenship scales, and which first reported the use of these scales in the schools contributing data for this investigation:

"The private schools . . . represented . . . by key letters . . . are all tuition schools situated in favorable environments in or near New York City. They are coeducational with one exception. The median or average intelligence quotient (I.Q.) for each one of these schools falls in the range from 110 to 120, inclusive.

"The New York City public school reported, referred to . . . as Public A, is situated in the lower east side of Manhattan. Practically all of the pupils are either Jewish or Italian, the Jewish children constituting the vast majority. With very few exceptions all the classes in the school are for boys only. Of those rated, only the Terman 'opportunity' classes include girls as well. Children are classified throughout the grades, in general, according to intelligence quotient, Aa classes being higher in intelligence than Ab classes, Ba than Bb, and so on. A classes are covering the first half of the work of the grade, B classes, the second. The median I.Q. for the entire school is approximately 90; that for the Terman classes, however, is higher than the median for the private schools included in the study. The one low 'opportunity' class rated includes a large proportion of borderline and dull children. Assignment to the ungraded classes . . . is made on the basis of ability to do grade work rather than strictly on the basis of mental age; chronological age, social adjustment, and mental ability being taken into account. The intelligence quotients of the children available at the time the ratings were made with very few exceptions fall below 75.

"The Binet schools and classes . . . grouped together . . . under the heading Public B, located in various parts of the city, are for feeble-minded children only. Pupils are graded in these classes mainly on the basis of mental age, although amount of previous training is also taken into consideration. . . .

"Classes are for boys and girls separately, or for both, as indicated. . . ." (136, pp. 62-63)

Two modifications of the grouping of the subjects as given in the tabulation on the preceding page were made in the correlational results reported for Part III in view of certain considerations explained below.

In the first place, all the subjects for Private Schools B, C, and D were combined. The reason for this combination lay in the small number of cases in each school; and the justification for it, in the similarity in the social composition of the classes and in the training and the personal qualifications of the teachers representing the different schools.

In the second place, the subjects in the regular grades and the opportunity classes of Public School A were divided into two groups, the first group being composed of the pupils in the regular grades, the one low opportunity class, and the corresponding Terman opportunity class (exclusive of the girls transferred to this group from another school), and the second group being composed of the pupils in the two upper-grade Terman opportunity classes. Both the reason and the justification for this division lay in the difference in the social composition of the two groups. Thus the pupils in the former group were all boys normally enrolled in Public School A in one of the lower grades, whereas the pupils in the latter group included not only especially gifted boys normally enrolled in Public School A in one of the upper grades, but also especially gifted girls transferred from a public school for girls in the vicinity that they might have the advantages afforded by the unique opportunity classes in Public School A.

The circumstances in which the measures employed in this part of the study became available were as follows: (1) during the second semester of the school year 1918-19 the teachers of the classes described rated their pupils on two of the citizenship scales named above, and the resulting conduct scores on the two scales afforded

<sup>4</sup> In this investigation the information in question is included in Appendix III, Section 2, A.

the measure of conduct required; (2) examiners associated in some way with the schools concerned<sup>5</sup> had given the individual intelligence test specified above to practically all of the pupils in these classes, and the intelligence quotients obtained by this means provided the measure of intelligence required.

## SECTION 2

### AN EXPLANATION OF THE PROCEDURES REQUIRED IN DETERMINING THE CORRELATION WITH INTELLIGENCE QUOTIENT

As in the preceding study, the first procedure employed was necessitated by the fact that the teachers did not rate all of their pupils with respect to every item on the measure of conduct employed: the citizenship chart in the case of Study 2a,<sup>6</sup> and the citizenship scales in the case of Study 2b.<sup>7</sup> The procedure consisted in the assignment of a reasonable credit for omitted items, and the subsequent calculation of the chart conduct score or the scale conduct score, as the case might be, in terms of all the items on the chart or the scales. Accordingly, the required steps<sup>8</sup> were taken for the pupils rated by each teacher collectively in the case of the chart, and for each pupil and each scale individually in the case of the scales, in those instances in which omissions in the ratings had occurred.

The measures were then ready for use in the calculation of the coefficients of correlation required in the correction for attenua-

<sup>5</sup> In the case of Private School A most of the individual intelligence examinations were given by the author as school psychologist.

<sup>6</sup> The omissions in the ratings on the citizenship chart amounted on the average to about one-fourth of the items on the entire chart, 23 pupils being rated on approximately three-fourths of the 100 items, 20 on approximately one-half, and 19 on practically the entire number.

<sup>7</sup> The omissions in the ratings on the citizenship scales were important, if at all, probably only in the ratings of four teachers, since all of the remaining teachers rated their pupils on more than two-thirds of the 48 items on the two scales (cf. Appendix III, Section 2, A).

<sup>8</sup> The steps in assigning credit for omitted items and in the subsequent calculation of the conduct score for the citizenship chart are specified in Appendix III, Section 4, B; and for the citizenship scales, in Appendix III, Section 4, A.

Obviously this procedure did not need to be repeated for the pupils in Private School A who served as subjects for both Study 1 and Study 2 b.

tion formula selected. This formula was the same as that utilized in Study I, and has already been given.

For Study 2a the following coefficients of correlation were calculated by the product-moment method for the entire group included in this part of the study:

1. Chart conduct score with intelligence quotient.
2. The sum of the odd items on the citizenship chart with the sum of the even items.<sup>9</sup>

The first of these coefficients was the figure  $r_{12}$  required in the numerator of the formula. The second of these supplied the figure necessary for the determination of the reliability coefficient  $r_{11}$  required in the denominator for the citizenship chart, by the application of the Spearman-Brown formula.<sup>10</sup>

The remaining step was the obtaining of the reliability coefficient  $r_{211}$  required in the denominator for intelligence quotient. The necessary figure was estimated by the present author for the entire group included in this part of the study from data concerning the reliability of the Stanford Revision of the Binet-Simon Scale (the test used in determining intelligence quotient) for a single grade group, supplied by the principal author of the test named.<sup>11</sup> Stated briefly, the procedure followed in making this estimate took into account the comparative heterogeneity with respect to intelligence quotient of the group included in this part of the study and the grade group for which data had been supplied.<sup>12</sup>

For Study 2b, since two measures of conduct were available, the

<sup>9</sup> This coefficient could be obtained for only 44 of the 62 cases because the papers for the pupils in two classes had not been preserved.

<sup>10</sup> As already explained in the last section of Chapter XXIII.

<sup>11</sup> Professor L. M. Terman of Leland Stanford University.

<sup>12</sup> Stated in more detail, this procedure was based on Kelley's formula showing the dependence of the reliability coefficient on the size and variability of the group, namely,

$$\frac{\sigma}{\Sigma} = \frac{\sqrt{1 - R}}{\sqrt{1 - r}} \text{ (cf. 144, p. 272),}$$

and involved the substitution in the numerator of this formula of the sigma of the distribution of the intelligence quotients for 149 first-grade children, given by Terman as 15.6 IQ, and in the denominator of this formula of the sigma of the distribution of the intelligence quotients for the one group of pupils included in Study 2a, as given in Appendix III, Section 3, together with the reliability coefficient for the grade group indicated, given by Terman as .92.



following coefficients of correlation were calculated by the product-moment method for the several groups included in this part of the study:

1. Scale conduct score 1 with intelligence quotient.
2. Scale conduct score 2 with intelligence quotient.
3. Scale conduct score 1 with scale conduct score 2.

In order to supply the figure  $r_{12}$  required in the numerator of the formula, as a further step the arithmetic mean of the two coefficients obtained between scale conduct score and intelligence quotient was taken.

Since the reliability coefficient  $r_{11}$  required in the denominator for the citizenship scales had been calculated, the remaining step was the obtaining of the reliability coefficient  $r_{211}$  required in the denominator for intelligence quotient. As in Study 2a, the necessary figure was estimated by the present author, this time individually for the several groups included in this part of the study, from the data which had been supplied as to the reliability of the test, the general procedure outlined above being followed.<sup>13</sup>

As soon as the reliability coefficients for the two parts of the study had been estimated, the required corrected coefficients were computed in routine fashion.

Finally, the probable errors of the unestimated reliability and the raw or alternate coefficients were determined by reference to a table of P.E. $r$  values, and the probable errors of the reliability coefficient for the measure of conduct in the case of Study 2a and of the corrected coefficients were calculated by means of appropriate formulae.<sup>14</sup>

<sup>13</sup> The detailed procedure was thus the same as that described in the preceding footnote, the sigmas of the distributions of the intelligence quotients of the several groups of pupils included in Study 2b, as given in Appendix III, Section 3, however, being substituted in the formula as appropriate in this case, in order to obtain a separate estimate for each group.

<sup>14</sup> The table referred to in obtaining the probable errors of the unestimated reliability and the raw or alternate coefficients and the formula for the probable errors of the corrected coefficients were the same as those used in the case of Study 1, and were cited in a similar connection in the preceding chapter. Since the reliability coefficient for the measure of conduct in the case of Study 2a had been determined by the application of the Spearman-Brown formula, the formula used in obtaining its probable error was adapted from the special formula for the standard error of such a coefficient derived by Shen, by inserting the constant when the P.E. rather than the  $\sigma$  is desired (cf. 184, p. 462).

## SECTION 3

THE PRESENTATION AND INTERPRETATION OF THE  
CORRELATIONAL RESULTS FOR INTELLIGENCE QUOTIENT

The presentation and interpretation of the correlational results for intelligence quotient included in this section is concerned with a single series of coefficients: coefficients of correlation between conduct score and intelligence quotient. The series of coefficients specified will now be considered.

*Coefficients of Correlation between Conduct Score and  
Intelligence Quotient*

Table XXV presents coefficients of correlation between conduct score and intelligence quotient. This table and the succeeding table, which presents comparable coefficients for mental age, are of particular interest because they afford evidence as to the relation between conduct and intelligence based on data in which an individual test was employed as the measure of intelligence.

The table has two major divisions, which serve to differentiate the various coefficients according to the type of conduct scores utilized. These major divisions are designated as follows:

- A. Calculated from Chart Conduct Scores.
- B. Calculated from Scale Conduct Scores.

The first of these divisions of the table includes the key name of the school for the one school represented by chart conduct scores, the school grades supplying data and the number of pupils who served as subjects in the investigation, the reliability coefficients for the measures correlated with the probable error for the measure of conduct, and the raw and the corrected coefficients calculated between conduct score and intelligence quotient with their respective probable errors; whereas the second of these divisions includes the key name of the school for the six schools represented by scale conduct scores, the school grades or classes supplying data and the number of pupils who served as subjects in the investigation, the reliability coefficients for the measures correlated with the probable error for the measure of conduct, and the alternate and the corrected coefficients calculated between conduct score and intelligence quotient with their respective probable errors.

## COEFFICIENTS OF CORRELATION BETWEEN CONDUCT SCORE AND INTELLIGENCE QUOTIENT

## A. Calculated from Chart Conduct Scores

KEY NAME OF SCHOOL	SCHOOL GRADES OR CLASSES SUPPLYING DATA	No. of PUPILS WHO SERVED AS SUBJECTS	RELIABILITY COEFFICIENTS WITH PROBABLE ERROR FOR MEASURE OF CONDUCT		RAW COEFFICIENT <sup>a</sup> WITH PROBABLE ERROR	CORRECTED COEFFICIENT WITH PROBABLE ERROR
			CCS/CCS <sup>b</sup>	IQ/IQ <sup>c</sup>		
Private A	I, II, III, III-IV, IV, V-VI	62 <sup>d</sup>	.98±.00	.94	.32±.08	.33±.08

## B. Calculated from Scale Conduct Scores

KEY NAME OF SCHOOL	SCHOOL GRADES OR CLASSES SUPPLYING DATA	No. of PUPILS WHO SERVED AS SUBJECTS	RELIABILITY COEFFICIENTS WITH PROBABLE ERROR FOR MEASURE OF CONDUCT		ALTERNATE COEFFICIENTS <sup>a</sup> WITH PROBABLE ERRORS	CORRECTED COEFFICIENT WITH PROBABLE ERROR
			SCS/SCS <sup>b</sup>	IQ/IQ <sup>c</sup>		
			REGULAR GRADES AND OPPORTUNITY CLASSES		SCS/IQ	SCS/IQ
Private A	I, II, III, IV, V	91	.83±.02	.89	.35±.06	.37±.07
Private B, C, D	I, II, III, IV, V-VI	50	.92±.01	.89	.20±.09	.18±.10
Public A	IB, IIA, IIB, IIIA, Op. IIA-IIB (low), Op. IIB-IIB (Terman), Op. VB-VIA (Terman), Op. VIIA (Terman)	305	.96±.00	.89	.43±.03	.43±.03
Public A	Op. VB-VIA (Terman), Op. VIIA (Terman)	46	.91±.02	.80	.08±.10	.14±.11
Public A	Ungraded I, II, III, IV	59	.75±.04	.82	.14±.09	.13±.12
Public B	Very low-, low-, middle-, middle-high-, high-grade	278	.90±.01	.83	.08±.04	.06±.05

## KEY TO SYMBOLS

CCS Chart Conduct Score.

IQ Intelligence Quotient.

SCS Scale Conduct Score.

Subscript 1 First Measure.

Subscript 2 Second Measure.

<sup>a</sup> Statisticians may be interested in considering in connection with the raw and the alternate coefficients given in the above table, the raw coefficients calculated between chart conduct score and intelligence quotient and between average scale conduct score and intelligence quotient for certain single grades or classes, and the alternate coefficients calculated between scale conduct score and intelligence quotient for certain combined grades or classes, given in Appendix III, Section 2, A and B. Because of the varying restriction in range represented by the different grade groupings and the variation in types of coefficients, no exact comparisons can be made. It is nevertheless of interest to note that approximately three-fourths of the 30 coefficients referred to confirm the evidence afforded by the coefficients reported above of a direct relation between conduct and intelligence.

<sup>b</sup> Estimated from the coefficient obtained between the sum of the odd and the sum of the even items.

<sup>c</sup> Estimated from data concerning the reliability of the test for a single grade group.

<sup>d</sup> The figure given applies only to the raw and the corrected coefficients, since data for the calculation of the reliability coefficient were available in only 44 of the 62 cases.

The second major division of the table has two minor divisions, which specify the type of school grade or class for which coefficients are reported. These minor divisions are designated as follows:

Regular Grades and Opportunity Classes.

Ungraded and Binet Classes.

The measures correlated in the present instance for the two types of conduct scores utilized are given below:

#### CHART CONDUCT SCORES

Chart Conduct Score (CCS) with

Intelligence Quotient (IQ).

#### SCALE CONDUCT SCORES

Scale Conduct Score (SCS) with

Intelligence Quotient (IQ).

All of the resulting coefficients are of significance in a consideration of the relation between conduct and intelligence.

The coefficients of correlation between conduct score and intelligence quotient presented in Table XXV afford consistent evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There is one private school represented in the coefficients calculated from chart conduct scores, and there are four private schools and two public schools represented in the coefficients calculated from scale conduct scores.

(2) The school grades supplying data range from I to V-VI in the case of chart conduct scores, while the school grades or classes supplying data range from I to Op. VIIA (Terman) for regular grades and opportunity classes, and from I to IV or from very low-grade to high-grade for ungraded and Binet classes in the case of scale conduct scores.

(3) The total number of pupils who served as subjects included in the one group measured by chart conduct scores was 62, while the number of pupils who served as subjects included in the six groups measured by scale conduct scores ranged from 46 to 305, with 492 as the total number of pupils from regular grades and opportunity classes and 337 as the total number from ungraded and Binet classes.

(4) The reliability coefficients for the two measures are all high, both in the case of chart conduct scores and in the case of scale

conduct scores; furthermore, the probable errors for the measure of conduct<sup>15</sup> are negligible or very nearly so in every instance.

(5) The raw coefficient for the two measures correlated in the case of chart conduct scores replaces the usual alternate coefficients because but one measure of conduct was available in this instance, and is four times its probable error in magnitude; the alternate coefficients for the two measures correlated in the case of scale conduct scores are very close in every instance, differing from one another on the average by only .055, but 6 of the 12 coefficients are less than twice their probable errors in magnitude.

(6) The corrected coefficient for the measures correlated in the case of the correlation with chart conduct score, which is in turn more than four times its probable error, is low; moreover, the corrected coefficients for the measures correlated in the case of the correlations with scale conduct score, which are again less than twice their probable errors in four out of six instances, although somewhat variable, tend in general to be low, as shown by the following tabulation:

Measures Correlated	No. of Coeffi- cients	Corrected Coefficients		
		<i>Single Coefficient or Weighted Quartile Points<sup>a</sup> Single Coefficient or Median    <math>Q_1</math> and <math>Q_3</math></i>		
A. CALCULATED FROM CHART CONDUCT SCORES				
Chart Conduct Score (CCS)				
with				
Intelligence Quotient (IQ)	1	.33		
B. CALCULATED FROM SCALE CONDUCT SCORES				
Scale Conduct Score (SCS)				
with				
Intelligence Quotient (IQ)	6	.18	.08 ...	.46

<sup>a</sup> The method of weighting used in the tabulation is quantitative, the weight applied to each coefficient corresponding to the number of pupils who served as subjects for the school group in question.

A critical examination of the corrected coefficients with reference to various factors which may affect the degree of relationship found discloses further facts of interest, as follows:

(1) A comparison of the coefficients for Private School A in the two major divisions of the table shows these results to be in very close agreement, although two different measures of conduct were used, and although the school grades and the pupils represented were identical only in part.

<sup>15</sup> No probable errors are given for the measure of intelligence, since the reliability coefficients in these instances were estimated.

(2) A comparison of the coefficients for Private School A and Private Schools B, C, and D combined, which have similar constituencies, shows an appreciably lower result in the latter case, doubtless due, in part at least, to the pooling of the data for several schools and to the small number of pupils per teacher with the resulting increased effect of individual idiosyncrasies in the ratings, factors presumably tending to lower the degree of relationship found. It is of interest to note that this finding is in harmony with the finding for the succeeding study of conduct score and mental age.

(3) A consideration of the coefficient obtained in the case of the regular grades combined with two opportunity classes for Public School A discloses that the somewhat marked degree of relationship found in this instance is of unusual significance in view of the restricted grade range and the large number of teachers, doubtless with varying standards, who rated their pupils.

(4) A consideration of the coefficients obtained in the case of the upper-grade Terman classes and the ungraded classes for Public School A and the classes for all grades of feeble-minded children for Public School B suggests that the low or negligible degree of relationship found in these instances can be readily explained by the highly restricted nature of the groups represented, the subjects being gifted and narrowly limited in grade range in the first instance and feeble-minded in the remaining two instances.

(5) Lastly, a consideration of the three coefficients in the two major divisions of the table which are at least four times their probable errors, representing the school groups rated by both measures of conduct for Private School A and the regular grades combined with two opportunity classes for Public School A, shows these results to be in fairly close agreement, and suggests that the correlation between conduct score and intelligence quotient under normal private or public elementary school conditions with a restricted grade range, and presumably with the most serious cases of delinquency excluded from the schools, tends to be rather low or somewhat marked.

In summary, then, it may be said that coefficients of correlation between conduct score and intelligence quotient point to a direct and low, or possibly a marked, relation between moral character and intelligence among school children in the United States. Nevertheless, this result is doubtless affected by various extraneous and selective factors which presumably tend to lower the degree of relationship found.

## CHAPTER XXVIII

### A STUDY OF THE CORRELATION BETWEEN CONDUCT SCORE AND MENTAL AGE

A STUDY of the correlation between conduct score and mental age presented in the three sections of this chapter includes a description of the data and the subjects represented in the study employing mental age as the measure of intelligence, an explanation of the procedures required in determining the correlation with mental age, and the presentation and interpretation of the correlational results for mental age.

#### SECTION I

##### A DESCRIPTION OF THE DATA AND THE SUBJECTS REPRESENTED IN THE STUDY EMPLOYING MENTAL AGE AS THE MEASURE OF INTELLIGENCE

The present study of the correlation between scores in conduct and intelligence, designated Study 3, in common with the study reported in the preceding chapter, considers the correlation between conduct score and individual intelligence test score, but, unlike the study already reported, employs mental age as the measure of intelligence.

In order to study the correlation between conduct score and mental age, coefficients of correlation were calculated between conduct score derived by the use of the Chassell-Upton Citizenship Scales, and mental age determined by means of the Stanford Revision of the Binet-Simon Scale; thereafter, the same measures of conduct and intelligence being employed, partial coefficients of correlation were calculated between conduct score and mental age with chronological age constant.

The data utilized in the calculations consisted of scale conduct scores and mental and chronological ages for the pupils also serving

as subjects in Study 2b; briefly, 492 pupils in the regular grades and the opportunity classes in four private schools and one public school, and 337 pupils in the ungraded classes in the same public school and in the special schools and classes in a city school system. Additional information regarding the subjects may be found in the preceding chapter.

The circumstances in which the measures employed in this study became available were as follows: (1) during the second semester of the school year 1918-19 the teachers of the classes described rated their pupils on two of the citizenship scales named above, and the resulting conduct scores on the two scales afforded the measure of conduct required in the present study, and also in Study 2b, as already explained; (2) the mental ages on the individual intelligence test specified above which corresponded to the date of rating on the conduct scales<sup>1</sup> were derived by the method described in the succeeding section, and thus provided the measure of intelligence required; and (3) the chronological ages on the date indicated<sup>1</sup> were ascertained in the manner described in the section referred to, and thereby supplied the additional measure required in the calculation of partial coefficients of correlation.

## SECTION 2

### AN EXPLANATION OF THE PROCEDURES REQUIRED IN DETERMINING THE CORRELATION WITH MENTAL AGE

Since, as indicated in the preceding chapter, the scale conduct scores for all the subjects were immediately available for use in the present study, the first procedures employed provided for the determination of the mental and the chronological ages at the date of rating on the conduct scales.

In the first place, in order to provide the measure of chronological age needed, and in addition to make possible the determination of the required mental ages, the chronological ages of the pupils in each class at the date of rating,<sup>2</sup> expressed in years and months,

<sup>1</sup> This precaution was necessitated by the fact that the date of rating and the date of testing did not coincide, the testing of the pupils in any one grade often extending over a long period of time and not necessarily being in the same year in which the ratings were assigned.

<sup>2</sup> Since an interval of several days frequently occurred between the dates of rating on the two scales, the date of the first scale rated was taken when



were ascertained<sup>3</sup> and tabulated pupil by pupil on the class sheets. Thereafter, the mental ages at the date of rating, expressed in years and months, were derived directly from the chronological ages at the date of rating by the use of the intelligence quotient as a multiplier.<sup>4</sup>

The measures were then ready for utilization in the complicated procedure<sup>5</sup> required to permit the application to the data of a partial correlation formula the component coefficients of which had been corrected for attenuation. Before the formula selected is presented, the following explanation will be necessary:

Let  $x_1$  = scale conduct score 1;

Let  $x_1$  = scale conduct score 2.

Let  $x_2$  = the obtained mental age;

Let  $x_{11}$  = a second equally excellent mental age, not available.

Let  $x_3$  = chronological age (a second measure of which is not required since the present measure may be assumed to be correct).

Let  $x_\infty$  = true scale conduct score;

Let  $x_\omega$  = true mental age.

Now  $x_3$  = true chronological age (as assumed above).

Then the true correlation between scale conduct score and mental age with chronological age constant can be ascertained by means of the following formula:

$$r_{\infty\omega.3} = \frac{r_{\infty\omega} - r_{\infty 3} r_{\omega 3}}{\sqrt{1 - r_{\infty 3}^2} \sqrt{1 - r_{\omega 3}^2}}.$$

needed for the calculation of the chronological ages in the manner described in the succeeding footnote.

<sup>3</sup> The chronological age was ordinarily obtained from the record of chronological age entered on the conduct scale itself, if this was available; otherwise, it was calculated directly from the date of birth, or indirectly from information as to chronological age when tested together with a record of the date tested.

<sup>4</sup> It will be noted that this procedure assumes the constancy of the intelligence quotient. Even if this theory should eventually be shown to require modification, it is probably sufficiently accurate for the purpose served in this instance.

Labor was economized in the process of ascertaining mental age on a specified date by the use of Inglis' *Intelligence Quotient Values* (151), since most of the required mental ages could be read directly from the tables by reversing the method of obtaining intelligence quotients.

<sup>5</sup> The writer is indebted to Professor T. L. Kelley, then of Leland Stanford University, for the procedure about to be outlined and the adaptation of the required formulae to the present problem.

It is apparent that this formula is the customary partial correlation formula adapted to the present problem and providing for the utilization of corrected rather than raw coefficients.

The preliminary correction for attenuation formulae needed to supply the corrected coefficients are:

$$r_{\infty\omega} = \frac{r_{12}}{\sqrt{r_{11}} \sqrt{r_{211}}}; \quad r_{\infty 3} = \frac{r_{13}}{\sqrt{r_{11}}}; \quad \text{and} \quad r_{\omega 3} = \frac{r_{23}}{\sqrt{r_{211}}}.$$

Again it is apparent that each of these formulae is but the correction for attenuation formula utilized in the preceding studies, or an adaptation of this formula to the requirements of the present problem.

To meet the requirements of the procedure outlined and at the same time to take advantage of the two measures of conduct available, the following coefficients of correlation were calculated by the product-moment method for the several groups included in the study:

1. Scale conduct score 1 with mental age.
2. Scale conduct score 2 with mental age.
3. Scale conduct score 1 with chronological age.
4. Scale conduct score 2 with chronological age.
5. Scale conduct score 1 with scale conduct score 2.
6. Mental age with chronological age.

In order to supply the figures  $r_{12}$  and  $r_{13}$  required in the numerators of the first two correction for attenuation formulae, as a further step the arithmetic means of the two coefficients obtained between scale conduct score and mental age, and between scale conduct score and chronological age, were taken.

Since the reliability coefficient  $r_{11}$  required in the denominators for the citizenship scales had been calculated, the remaining step was the obtaining of the reliability coefficient  $r_{211}$  required in the denominators for mental age. As in Study 2b, the necessary figure was estimated by the present author individually for the several groups included in the study from data concerning the reliability of the Stanford Revision of the Binet-Simon Scale (the test used in determining mental age) for certain age groups, supplied by the principal author of the test named.<sup>6</sup> Stated briefly,

<sup>6</sup> Professor L. M. Terman of Leland Stanford University.

the procedure followed in making this estimate took into account the comparative heterogeneity with respect to mental age of the groups included in the study and the appropriate age groups for which data were supplied.<sup>7</sup>

As soon as these reliability coefficients had been estimated, the required corrected coefficients were computed as indicated above.

Subsequently, the probable errors of the unestimated reliability and the alternate or raw coefficients were determined by reference to a table of P.E.*r* values, and the probable errors of the corrected coefficients were calculated by means of an appropriate formula.<sup>8</sup>

Finally, the true correlation between scale conduct score and mental age with chronological age constant was ascertained in the case of each group by means of the formula for the purpose given at the opening of this discussion.<sup>9</sup>

<sup>7</sup> Stated in more detail, this procedure was based on Kelley's formula showing the dependence of the reliability coefficient on the size and variability of the group, as given in a similar connection in the preceding chapter, and involved the substitution in the numerator of this formula of the sigmas of the distributions of the mental ages of certain age groups, given by Terman as 12.61, 13.74, and 18.47 for ages 8, 10, and 12, respectively; and in the denominator of this formula of the sigmas of the distributions of the mental ages of the several groups included in Study 3, as given in Appendix III, Section 3, together with the reliability coefficients for the age groups indicated, given by Terman as .92, .93, and .94, respectively, the particular sigma and reliability coefficient substituted in the formula for the data supplied by Terman corresponding to the mean chronological age of the group for which the estimate was being made, as given in the section of the Appendix already referred to, the number of months beyond the basal age in each case being disregarded.

It will be noted that the procedure outlined above follows that utilized in Study 2b, except that the mean chronological age of the several groups included in the study is taken into consideration in each case. This step appeared necessary in estimating the required figures for mental age, although omitted in estimating the required figures for intelligence quotient, in view of the following statement made by Professor Terman in a personal letter, dated December 16, 1927: "... if reliability is computed on mental age it is very much raised by having a wide range of children; but if the reliability is based upon IQ, range has no effect, in so far as IQ is positively and negatively correlated with age."

<sup>8</sup> The table of P.E.*r* values referred to and the probable error formula employed were the same as those used in Study 1, and were cited in a similar connection in Chapter XXVI.

<sup>9</sup> A method of computing the probable error of a partial coefficient of correlation obtained by the use of the formula referred to had not been devised at the time the formula was applied.

## SECTION 3

THE PRESENTATION AND INTERPRETATION OF THE  
CORRELATIONAL RESULTS FOR MENTAL AGE

The presentation and interpretation of the correlational results for mental age included in this section is concerned with the following zero order and first order series of coefficients: coefficients of correlation between conduct score, mental age, and chronological age and partial coefficients of correlation between conduct score and mental age with chronological age constant. The series of coefficients specified will now be considered.

*Coefficients of Correlation between Conduct Score, Mental Age, and Chronological Age and Partial Coefficients of Correlation between Conduct Score and Mental Age with Chronological Age Constant*

Table XXVI presents coefficients of correlation between conduct score, mental age, and chronological age and partial coefficients of correlation between conduct score and mental age with chronological age constant. As already indicated, this table and the preceding table, which presents comparable coefficients for intelligence quotient, are of particular interest because they afford evidence as to the relation between conduct and intelligence based on data in which an individual test was employed as the measure of intelligence. Moreover, because of the refined statistical technique employed in this instance, the correlational results reported constitute the most important evidence as to the relation between morality and intellect obtained in the two investigations by the author.

The table includes the key name of the school for the six schools represented, the school grades or classes supplying data and the number of pupils who served as subjects in the investigation, the reliability coefficients for the measures correlated with the probable error for the measure of conduct, the alternate or raw coefficients and the corrected coefficients of zero order calculated between conduct score, mental age, and chronological age with their respective probable errors, and the corrected coefficient of the first order calculated between conduct score and mental age with chronological age constant.

TABLE XXVI

COEFFICIENTS OF CORRELATION BETWEEN CONDUCT SCORE, MENTAL AGE, AND CHRONOLOGICAL AGE  
AND PARTIAL COEFFICIENTS OF CORRELATION BETWEEN CONDUCT SCORE  
AND MENTAL AGE WITH CHRONOLOGICAL AGE CONSTANT

KEY NAME OF SCHOOL	SCHOOL GRADES OR CLASSES SUPPLYING DATA	No. of PUPILS WHO SERVED AS SUBJECTS	RELIABILITY COEFFICIENTS WITH PROBABLE ERROR FOR MEASURE OF CONDUCT			ALTERNATE OR RAW COEFFICIENTS* WITH PROBABLE ERRORS								CORRECTED COEFFICIENTS OF ZERO ORDER* WITH PROBABLE ERRORS			CORRECTED COEFFI- CIENT OF FIRST ORDER*
			SCS1SC2	MA1MA2 <sup>b</sup>	CA1CA2 <sup>c</sup>	SCS1MA	SCS2MA	SCS3CA	SCS3CA	MA CA	SCS MA	SCS CA	MA CA				
						REGULAR GRADES AND OPPORTUNITY CLASSES											
Private A Private B, C, D Public A	I, II, III, IV, V I, II, III, IV, V-VI IB, IIA, IIB, IIIA, Op. IIA-IIIB (low), Op. IIA-IIIB (Terman) Op. VB-VIA (Terman), Op. VIIA (Terman)	91	.83±.02	.98	1.00	.27±.07	.09±.07	.05±.07	-.10±.07	.80±.03	.20±.08	-.03±.09	.81±.03	.38			
		50	.92±.01	.98	1.00	.42±.08	.45±.08	.37±.08	.37±.08	.79±.04	.40±.08	.39±.09	.80±.04	.27			
		305	.96±.00	.90	1.00	.23±.04	.20±.04	-.33±.03	-.34±.03	.23±.04	.23±.04	-.34±.04	.24±.04	.35			
Public A		46	.91±.02	.97	1.00	.46±.08	.46±.08	.61±.06	.56±.07	.82±.03	.49±.08	.61±.07	.83±.03	-.05			
Public A Public B	Ungraded I, II, III, IV Very low-, low-, low- middle-, middle-, middle-high-, high- grade	59	.75±.04	.93	1.00	.24±.08	.05±.09	.19±.08	.01±.09	.66±.05	.18±.10	.12±.10	.68±.05	.13			
		278	.90±.01	.93	1.00	.33±.04	.31±.04	.31±.04	.33±.04	.50±.03	.36±.04	.34±.04	.52±.03	.23			

KEY TO SYMBOLS

SCS Scale Conduct Score.

MA Mental Age.

CA Chronological Age.

Subscript 1 First Measure.

Subscript 2 Second Measure.

\* Statisticians may be interested in considering in connection with the alternate or raw coefficients and the corrected coefficients of zero order and of the first order given in the above table, the raw coefficients calculated between average scale conduct score and mental age for certain single grades or classes, the alternate or raw coefficients calculated between scale conduct score, mental age, and chronological age, and the raw coefficients of zero order calculated between average scale conduct score, mental age, and chronological age, and of the first order between average scale conduct score and mental age with chronological age constant for certain combined grades or classes, presented in Appendix III, Section 2, A and B. Because of the varying restriction in range represented by the different grade groupings and the variation in types of coefficients, no exact comparisons can be made. It is nevertheless of interest to note that approximately three-fourths of the 43 coefficients referred to which are of significance in a study of this relationship confirm the evidence afforded by the coefficients reported above of a direct relation between conduct and intelligence.

<sup>b</sup> Estimated from data concerning the reliability of the test for certain age groups.

<sup>c</sup> Estimated from the nature of the data.

The table has two minor divisions, which specify the type of school grade or class for which coefficients are reported. These minor divisions are designated as follows:

Regular Grades and Opportunity Classes.

Ungraded and Binet Classes.

The measures correlated in the present instance are given below:

Scale Conduct Score (*SCS*) with

Mental Age (*MA*), and Chronological Age (*CA*).

Mental Age (*MA*) with

Chronological Age (*CA*).

Of the resulting coefficients, the first is of interest in a consideration of the relation between conduct and intelligence, and all are essential to the calculation of the partial coefficient of correlation. The first order coefficient, in turn, is of interest in a consideration of the relation between conduct and intelligence with the influence of chronological age eliminated.

The coefficients of correlation between conduct score, mental age, and chronological age and the partial coefficients of correlation between conduct score and mental age with chronological age constant presented in Table XXVI afford fairly consistent evidence of a positive correlation between moral character and intelligence.

A consideration of the information given in the different columns of the table discloses the following facts:

(1) There are four private schools and two public schools represented in the coefficients calculated from scale conduct scores.

(2) The school grades or classes supplying data range from I to Op. VIIA (Terman) for regular grades and opportunity classes, and from I to IV or from very low-grade to high-grade for ungraded and Binet classes.

(3) The number of pupils who served as subjects ranged from 46 to 305, with 492 as the total number of pupils from regular grades and opportunity classes and 337 as the total number from ungraded and Binet classes.

(4) The reliability coefficients for the three measures are all high;<sup>10</sup> furthermore, the probable errors for the measure of conduct<sup>11</sup> are negligible or very nearly so in every instance.

<sup>10</sup> Obviously the reliability coefficients for chronological age approach unity by the very nature of the measure in question.

<sup>11</sup> No probable errors are given for the measure of intelligence nor for

(5) The alternate coefficients for the measures correlated are very close in eight of the twelve instances, and fairly close in the remaining four instances, differing from one another on the average by only .07, while 16 of the 24 coefficients are more than four times their probable errors in magnitude; one series of raw coefficients replaces the usual alternate coefficients because but one measure of either mental age or chronological age was available, and 5 of the 6 coefficients are more than ten times their probable errors.

(6) The corrected coefficients for the measures correlated, which are in turn more than four times their probable errors in fourteen out of eighteen instances in the case of the zero order coefficients, although extremely variable when all zero order coefficients are considered and somewhat variable when the first order coefficients are considered, tend in general to be low in the case of correlations between conduct score and mental age, whether zero order or first order coefficients are under consideration, to be low in the case of correlations between conduct score and chronological age, and to be marked in the case of correlations between mental age and chronological age, as shown by the following tabulation:

Measures Correlated	No. of Coeffi- cients	Corrected Coefficients					
		Zero Order			First Order		
		Weighted Quartile Points <sup>a</sup>					
		Median	Q <sub>1</sub>	and Q <sub>3</sub>	Median	Q <sub>1</sub>	and Q <sub>3</sub>
Scale Conduct Score (SCS) with Mental Age (MA) . . . . .	6	.24	.21	. . . . . .37	.28	.21	. . . . . .37
Scale Conduct Score (SCS) with Chronological Age (CA) . . . . .	6	.11	-.32	. . . . . +.32			
Mental Age (MA) with Chronological Age (CA) . . . . .	6	.51	.23	. . . . . .68			

<sup>a</sup> The method of weighting used in the tabulation is quantitative, the weight applied to each coefficient corresponding to the number of pupils who served as subjects for the school group in question.

A critical examination of the corrected coefficients of the first order with reference to various factors which may affect the degree of relationship found discloses further facts of interest, as follows:

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chronological age, since the reliability coefficients in these instances were estimated.

(1) A comparison of the coefficients for Private School A' and Private Schools B, C, and D combined, which have similar constituencies, shows an appreciably lower result in the latter case, doubtless due, in part at least, to the pooling of the data for several schools and to the small number of pupils per teacher with the resulting increased effect of individual idiosyncrasies in the ratings, factors presumably tending to lower the degree of relationship found. It is of interest to note that this finding is in harmony with the finding for the preceding study of conduct score and intelligence quotient.

(2) A consideration of the coefficient obtained in the case of the regular grades combined with two opportunity classes for Public School A suggests that the rather low degree of relationship found in this instance may be explained in part by the restricted grade range and the large number of teachers, doubtless with varying standards, who rated their pupils.

(3) A consideration of the coefficients obtained in the case of the upper-grade Terman classes and the ungraded classes for Public School A and the classes for all grades of feeble-minded children for Public School B suggests that the low or negligible degree of relationship (one coefficient actually being negative) found in these instances can be readily explained by the highly restricted nature of the groups represented, the subjects being gifted and narrowly limited in grade range in the first instance and feeble-minded in the remaining two instances.

(4) Lastly, a comparison of the three coefficients which were derived from the largest populations, representing the regular grades for Private School A, the regular grades combined with two opportunity classes for Public School A, and the classes for all grades of feeble-minded children for Public School B, with the remaining three coefficients in the table discloses that the results for the largest populations, although consistently low, are in each instance higher than the coefficients for the smaller groups of somewhat similar type (in one case being positive rather than negative), and suggests that the correlation between conduct score and mental age with chronological age constant in still larger populations of elementary school children, even with a restricted grade or intelligence range, and with a similarly restricted range in morality, because of the lessened effect of such extraneous factors as the number of schools represented in a given result, the number of pupils rated by a given teacher, and the variation in the standards of the teachers contributing ratings, might prove to be somewhat higher than these results indicate.

A comparison between the zero order and the first order corrected coefficients for conduct score correlated with mental age



yields the following data with reference to the effect of chronological age upon the degree of relationship found:

(1) In the case of the regular grades and opportunity classes, the relation between conduct score and mental age is appreciably higher for Private School A, appreciably lower for Private Schools B, C, and D combined, and appreciably higher for the comparatively unselected group representing Public School A, when chronological age is held constant; while a somewhat marked positive correlation for the highly selected group representing Public School A changes to negligible but negative when the effect of this factor has been eliminated.

(2) In the case of the ungraded and Binet classes, the relation between conduct score and mental age is slightly lower for Public School A and appreciably lower for Public School B when chronological age is held constant.

These facts apparently signify that the elimination of the influence of chronological age tends on the whole to lower the degree of relationship between conduct and intelligence found in the present study. Notwithstanding, but little significance can be attached to this finding, although it is based on a direct comparison of individual coefficients, in view of the fact that the weighted medians for the zero order and first order corrected coefficients as given in the preceding tabulation suggest a different finding from the conclusion stated, as a result of the relative magnitude and numerical strength of the coefficients involved in the comparison for the two school groups showing a higher degree of relationship with chronological age constant. The importance of the factor of chronological age would thus seem to be established for individual groups only.

A cross-comparison of the zero order and the first order corrected coefficients for conduct score correlated with mental age, reported in Table XXVI, and the corresponding corrected coefficients for conduct score correlated with intelligence quotient, reported in Table XXV, affords the following information as to the effect of the method of expressing the test result, and also as to the effect of chronological age, upon the relation between conduct and intelligence found in the investigation:<sup>12</sup>

<sup>12</sup> In calculating the differences between the contrasted results in this discussion, a lower result in the second case than in the first on a scale from +1.00 to -1.00 was counted as a decrease and a higher result as an increase in the degree of relationship, the proper sign being prefixed. The simple median of these differences is the figure reported.

(1) A change in the method of expressing the test result from mental age to intelligence quotient with no provision in the first series of results for eliminating the factor of chronological age apparently tends to be accompanied by an appreciable decrease in the degree of relationship, since the median difference between the contrasted coefficients is  $-.165$ , the second of these coefficients being lower than the first for four of the six school groups represented in the comparison.<sup>13</sup>

(2) A change in the method of expressing the test result from mental age to intelligence quotient with the effect of chronological age held constant in the first series of results by the application of the partial correlation technique apparently tends to have an indifferent effect upon the degree of relationship found, since the median difference between the contrasted coefficients is only  $-.005$ , the second of these coefficients being lower than the first for three of the six school groups represented in the comparison, equal to the first for one school group, and higher than the first for two school groups.<sup>14</sup>

It is evident that the finding of a lower degree of relationship between conduct and intelligence when chronological age is taken into account, either by the use of a ratio rather than a score or by the application of the partial correlation technique,<sup>15</sup> again suggests

<sup>13</sup> The corrected coefficients involved in the comparison for mental age with the effect of chronological age disregarded and intelligence quotient, in the order in which they are used in the discussion, are (1) the zero order coefficients calculated between Scale Conduct Score and Mental Age (*SCS MA*), reported in Table XXVI, and (2) the coefficients calculated between Scale Conduct Score and Intelligence Quotient (*SCS IQ*), reported in Table XXV.

<sup>14</sup> The corrected coefficients involved in the comparison for mental age with the effect of chronological age eliminated and intelligence quotient, in the order in which they are used in the discussion, are (1) the first order coefficients calculated between Scale Conduct Score and Mental Age with Chronological Age constant (*SCS MA.CA*), reported in Table XXVI, and (2) the coefficients calculated between Scale Conduct Score and Intelligence Quotient (*SCS IQ*), reported in Table XXV.

It will be noted that a change in the type of relation is involved in one instance.

<sup>15</sup> In evaluating the results of this comparison it is of course necessary to keep in mind that the two methods of taking chronological age into account are not theoretically equivalent, and that in the first method no provision is made for equalizing the effect of chronological age in the case of the measure of conduct employed. By reference to Table XXVI, however, it will be found that the corrected coefficients obtained between scale conduct score and chronological age (whether positive or negative) with one exception are negligible or low.

It should further be observed that the conclusion with reference to the application of the partial correlation technique stated above may be inferred from the findings of the comparison as a whole, and is in accord with the

the importance of chronological age and points to the necessity of taking the method of expressing the test result into account in studies of the relation between morality and intellect.<sup>16</sup> At the same time, the substantial agreement in the two series of results last compared confirms the genuineness of the relationship between conduct and intelligence revealed in both instances, without, however, mitigating the effect of the factors already mentioned as tending to lower the degree of relationship found.

In summary, then, it may be said that coefficients of correlation between conduct score and mental age and partial coefficients of correlation between conduct score and mental age with chronological age constant point to a direct and low relation between moral character and intelligence among school children in the United States. Nevertheless, this result is doubtless affected by various extraneous and selective factors which presumably tend to lower the degree of relationship found.

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conclusion based on the comparison of zero order and first order corrected coefficients which precedes, although a contrary finding in the case of the combined results due to important exceptions to the general rule is shown to detract from its significance.

<sup>16</sup> It will be recalled that further proof of the influence of the method of expressing the test result, which is in substantial agreement with the finding reported in this chapter, was offered in two earlier divisions of the research, in connection with the interpretation of Table VI in Chapter VI and of Table IX in Chapter IX.

At the same time, it should be noted that the elimination of the effect of chronological age by the application of the partial correlation technique resulted on the whole in the finding of a higher degree of relationship (on a scale from +1.00 to -1.00) between delinquency and mental inferiority in the case of certain studies by other investigators, as analyzed in an earlier division of the research in connection with the interpretation of Table VI in Chapter VI. In the studies referred to, however, 7 out of 9 of the original coefficients and 5 out of 9 of the corresponding partial coefficients were negative (if interpreted from the standpoint of the relation between delinquency and mental inferiority).

Lastly, attention should be called to the fact that the effect of the method of expressing the test result in the case of coefficients of colligation obtained by the statistical reduction of the non-correlational studies was very briefly considered, and was stated to appear to be of some importance although its effect could be disregarded in a consideration of the data as a whole, in an earlier division of the research, in connection with the interpretation of Table I in Chapter VI. Moreover, this matter is more fully considered and the data upon which this decision was based are analyzed in detail in the separate monograph presenting the tabular review of non-correlational studies of the relation between delinquency and mental inferiority (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chap. 5).

## CHAPTER XXIX

### A SYNTHESIS OF THE INVESTIGATION OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE

THE justification for a synthesis of the investigation presented in Part III is identical in principle with the justification for the syntheses of the investigations included in the other parts of the research. It lies in the opportunity for formulating general conclusions as to the relation between conduct and intelligence, and hence as to the relation between morality and intellect, afforded by a summary of the findings of the studies included. Accordingly, this chapter provides a synthesis of the investigation of the relation between conduct and intelligence.

The synthesis presented in the two sections of this chapter includes an explanation of the method of combining coefficients of correlation for school children, and a compilation of the correlational results of studies of the relation between conduct and intelligence.

#### SECTION I

##### AN EXPLANATION OF THE METHOD OF COMBINING COEFFICIENTS OF CORRELATION FOR SCHOOL CHILDREN<sup>1</sup>

Although the method of combining coefficients of correlation for school children does not contravene the procedures employed in the case of other types of groups, an explicit rephrasing and amplification in terms of the needs of the present division of the research is desirable.

The procedure for combining the correlational results for school

<sup>1</sup> An explanation of the method of combining coefficients of correlation for all types of subjects, which applies only to the syntheses of the investigations included in the research, will be found in Chapter XXXI.

children called first for a tabular review of the investigation of the relation between conduct and intelligence confined to the results bearing upon the problem of the relation between moral character and intelligence, then for a series of tabulations summarizing the results as presented in the individual tables, and lastly for a compilation of the correlational results included in the tabular review, which should consistently provide for a classification according to types of evidence, and should likewise be concentrated as far as the heterogeneity of the data and the function served by the coefficients combined permitted. The procedure thus involved the calculation of quantitatively weighted quartile or percentile points, as appropriate, for the zero order uncorrected and corrected coefficients and for the first order corrected coefficients for the single type of evidence and the one type of group and country represented, and also for the smaller groupings of the data as presented in the original tables.

The rules followed in combining coefficients of correlation for school children for presentation in the different series of combined results differed slightly, and were governed by the limitations of tabular space and the subsequent interpretive use of the combined results. These rules may be formulated as follows:

1. For report in the tabular review of the investigation, calculate the weighted medians of the uncorrected and corrected zero order and corrected first order coefficients required for a balanced synopsis of results, multiplying each mean coefficient in the case of the mean of the alternate zero order coefficients, and each individual coefficient in the case of the corrected zero order and first order coefficients, by the corresponding number of cases.

2. For report in the series of tabulations summarizing the results for individual tables, calculate the weighted quartile points<sup>2</sup> of the corrected coefficients, weighting according to population as described above.

3. For report in the compilation of correlational results, calculate the weighted quartile and percentile points<sup>3</sup> of the uncorrected and corrected zero order and corrected first order coefficients required in a synthesis of the investigation, weighting according to population as described above.

<sup>2</sup> The weighted median and the weighted lower and upper quartile points were calculated in every case unless a single coefficient only was available.

<sup>3</sup> The weighted lower and upper quartile points as well as the weighted median were calculated in each case because the number of coefficients did not fall below six, the weighted 10- and 90-percentile points also being reported when the number of coefficients was not less than ten.

## SECTION 2

A COMPILATION OF THE CORRELATIONAL RESULTS OF  
STUDIES OF THE RELATION BETWEEN CONDUCT  
AND INTELLIGENCE

Table XXVII presents a compilation of the correlational results of studies of the relation between conduct and intelligence.<sup>4</sup>

The table summarizes the correlational results for the one type of evidence, the one type of group, the single country, and the one type of coefficient represented in the investigation, the particular information called for in this compilation including the total population, the number of coefficients, and certain weighted quartile or percentile points, as appropriate, for the product-moment coefficients of correlation combined, these results being given in turn for the mean of the alternate or the raw and the corrected zero order coefficients, and for the corrected first order coefficients.

The compilation of the correlational results of studies of the relation between conduct and intelligence presented in Table XXVII may be interpreted briefly as follows:

(1) The correlation between conduct and intelligence as found in the case of School Children, United States, is positive, but somewhat variable.

(2) If the results actually found without correction for attenuation due to chance inaccuracies in the original measures are taken as the basis of interpretation, the degree of correlation revealed by Results of Tests of Verbal Abstract Intelligence tends to be rather low.

(3) If the results corrected for attenuation due to chance inaccuracies in the original measures are taken as the basis of interpretation, the degree of correlation revealed by this type of evidence, although slightly increased, still tends to be rather low.

(4) If the effect of chronological age is eliminated by the application of the partial correlation technique to the most significant results included above, the degree of correlation revealed by this type of evidence in the case of these first order corrected coefficients, although slightly higher than the degree of correlation revealed by the corresponding zero order corrected coefficients, tends to remain fairly low.

By further reference to the table it will be observed that the central tendency of the full number of zero order uncorrected co-

<sup>4</sup> A frequency distribution of the coefficients included in this compilation of correlational results for Part III will be found in Appendix IV, Section 2.

TABLE XXVII  
A COMPILATION OF THE CORRELATIONAL RESULTS OF STUDIES OF THE RELATION BETWEEN  
CONDUCT AND INTELLIGENCE

TYPE OF EVIDENCE	TYPE OF GROUP AND COUNTRY	TOTAL POPULATION <sup>a</sup>	NO. OF COEFFICIENTS <sup>b</sup>	CORRELATIONAL RESULTS									
				PRODUCT-MOMENT COEFFICIENTS OF CORRELATION									
				ZERO ORDER					FIRST ORDER				
				MEAN OF ALTERNATE OR RAW		CORRECTED			CORRECTED		CORRECTED		
				WEIGHTED QUANTILE OR PERCENTILE POINTS <sup>c</sup>		WEIGHTED QUANTILE OR PERCENTILE POINTS			WEIGHTED QUANTILE OR PERCENTILE POINTS		WEIGHTED QUANTILE POINTS		
				MEDIAN	Q1 AND Q3	P10 AND P90	MEDIAN	Q1 AND Q3	P10 AND P90	MEDIAN	Q1 AND Q3	P10 AND P90	
Results of Intelligence Tests Results of Tests of Verbal Intelligence	School Children United States	1,827	14	.30	.16 ... .40	.08 ... .44	.32	.18 ... .45	.08 ... .49	.28	.21 ... .37 <sup>e</sup>		
		829 <sup>d</sup>	6	.24	.20 ... .32		.24	.21 ... .37					

<sup>a</sup> The number tabulated is the gross number of cases represented by all the coefficients (whether the mean of the alternate or the raw or the corrected coefficients) opposite the number in question, regardless of any duplication that may have occurred in the subjects for these coefficients.

<sup>b</sup> Since the main uncorrected coefficients used in this investigation, with a single exception, were calculated from the two halves of the data for one measure and the undivided data for the other measure, and since a mean of the resulting alternate coefficients was used to represent each pair of alternate coefficients in combining the correlational results of the investigation, the figure given represents the actual number of these mean coefficients plus the 1 raw coefficient, and at the same time represents the actual number of the corresponding corrected coefficients.

<sup>c</sup> The method of weighting used throughout the compilation was quantitative. The weight applied to each coefficient corresponded to the number of cases represented by the coefficient in question, this number being taken as the frequency of that coefficient in the calculation of the weighted quartile or percentile points.

<sup>d</sup> This population of 829 cases is included in the population of 1,827 cases for which results are reported above.

<sup>e</sup> The variable held constant is chronological age.

efficients falls at .30, and of the corresponding corrected coefficients only slightly above, and that the central tendency of the most significant of these coefficients, whether uncorrected or corrected, falls between .20 and .30, and remains below the maximum figure even after the effect of chronological age is held constant. This similarity in the results suggests a negligible or slight effect upon the degree of relationship of chance inaccuracies in the original measures and of the factor of chronological age.

In conclusion, therefore, it may be stated that the evidence as to the relation between moral character and intelligence presented in Part III of the research is very clear and definite, and indicates that a direct and low relation exists between morality and intellect among school children in the United States.

In comment upon this conclusion, however, it should be pointed out that much of the data considered in this investigation are for feeble-minded or superior pupils, and that all the children represented were enrolled in private or public elementary schools from which serious cases of delinquency were presumably excluded, with the result that many of the subjects were highly selected—either favorably or unfavorably—with respect to intelligence, and all were probably somewhat selected with respect to moral character; and that, in addition, various other selective or extraneous factors, notably grade range and possibly also chronological age,<sup>5</sup> have had their part in either lowering or raising the degree of relationship found.<sup>6</sup> Since the total effect of these factors has presumably been to lower the results obtained, the true relation between morality and intellect in accurately measured unselected groups of the type investigated is almost certainly higher than these results indicate. At the same time, it is hardly probable that the relation is high. Hence the conclusion is apparently justified that there is a direct and marked relation between morality and intellect among school children in the United States.

<sup>5</sup> Although the combined results show only a slight effect for this factor, it will be recalled that in individual groups it may have a noteworthy effect.

<sup>6</sup> Attention has already been called to the influence of such factors in the detailed interpretations of the individual tables in the preceding chapters. The matter is further discussed in a consideration of various factors which affect the correlational results of the research, including an analysis of the effect of different types of subjects, an analysis of the effect of different types of evidence, types of groups, countries, and types of coefficients, and an analysis of the effect of chance inaccuracies in the original measures, to which Chapter XXXII will be devoted.



## CONCLUSION



## CHAPTER XXX

### A COMPARATIVE STUDY OF THE THREE PARTS OF THE RESEARCH

THE four chapters which conclude the research offer in turn a comparative study of the three parts of the research, a synthesis of the several investigations of the relation between morality and intellect included in the research, a consideration of various factors which affect the correlational results of the research, and a summary and evaluation of the findings of the research as to the relation between morality and intellect.

The comparative study presented in the two sections of this chapter calls for a comparison of the three parts of the research as to types of evidence, types of groups, and countries, and a comparison of the three parts of the research as to correlational results.

#### SECTION I

##### A COMPARISON OF THE THREE PARTS OF THE RESEARCH AS TO TYPES OF EVIDENCE, TYPES OF GROUPS, AND COUNTRIES

The necessary data for the present comparison are immediately available in the tabulations included in the syntheses of studies presented in Chapters VII and X, which provide in turn the compilations of the correlational results of studies of the relation between delinquency and mental inferiority and of studies of the relation between moral character and intelligence,<sup>1</sup> and in Tables XXI and XXVII, which respectively present the compilations of the correlational results of studies of the relation between moral and intellectual traits and of studies of the relation between conduct and intelligence. The facts required for this comparison are readily identifiable, and need not be reproduced.

<sup>1</sup> The information supplied in the two tabulations cited corresponds to the analyses of the three primary methods of classification employed in the research as applied to studies in feeble-minded and delinquent groups and studies in non-delinquent groups, as given in Chapters III and VIII.

The comparison of the three parts of the research as to types of evidence, types of groups, and countries based on the data referred to discloses the following information:

(1) Studies of the relation between delinquency and mental inferiority, presented in Part IA' of the research, and studies of the relation between moral character and intelligence, presented in Part IB, Part II, and Part III, have two major types of evidence in common, namely, Reports of Educational Status and Results of Intelligence Tests. Of the constituent minor types of evidence five are also shared, as follows: Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement, Results of Tests of Verbal Abstract Intelligence, and Results of Tests of Mechanical Intelligence. Moreover, an additional major type of evidence contributed by studies in delinquent groups is similar to one contributed by studies in non-delinquent groups, the two types of evidence in question being Estimates of Mental Deficiency and Ratings as to Intelligence. On the other hand, studies of the relation between delinquency and mental inferiority contribute one distinctive major type of evidence represented solely by feeble-minded groups, namely, Reports concerning Delinquency, and three distinctive minor types of evidence represented solely by delinquent groups, namely, Reports of Illiteracy, Results of Army Mental Tests, and Results of Tests of Non-Verbal Concrete Intelligence; whereas studies of the relation between moral character and intelligence contribute one distinctive major type of evidence represented solely by non-delinquent groups, namely, Reports of Extra-Curricular Activities.

(2) The types of feeble-minded and delinquent groups represented by studies of the relation between delinquency and mental inferiority are not duplicated in any instance by the types of non-delinquent groups represented by studies of the relation between moral character and intelligence. Notwithstanding, juvenile and adult or mainly adult groups are involved in the studies for all types of subjects, the most important types of groups in each case being as follows: for feeble-minded groups, Feeble-Minded Persons at Large in Community<sup>2</sup> and Feeble-Minded Children in Public Schools; for

<sup>2</sup> Although this classificatory heading could apply equally well to juvenile groups, reference to the appropriate detailed table in the tabular review of non-correlational studies of the relation between delinquency and mental inferiority, as given in a separate monograph, discloses that actually all the groups so classified were adult or mainly adult, the individual members of these groups apparently being not less than 16 years of age in any case. The detailed table referred to in this instance is as follows:

Table 1. A Comparison between Paired Feeble-Minded and Non-Feeble-Minded Groups as to Delinquency

(cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chap. 2).

delinquent groups, Adult Criminals and Juvenile Delinquents; and for non-delinquent groups, College Students and School Children.

(3) Although studies of the relation between delinquency and mental inferiority are represented, singly or in combination, by a large number of countries, speaking several different languages, the only countries with multiple entries are the United States, Canada, Great Britain, and Germany; at the same time, studies of the relation between moral character and intelligence, save for a single occurrence of a group of European countries in combination, are represented solely by English-speaking countries, namely, the United States and Great Britain.

(4) The types of evidence, the types of groups, and the single country represented in the studies of the relation between moral character and intelligence by the author, included in the investigations of the relation between moral and intellectual traits and of the relation between conduct and intelligence reported in Parts II and III of the research, are comprehended in the types of evidence, the types of groups, and the countries represented in the studies of the relation between moral character and intelligence by many investigators reviewed in Part IB.<sup>3</sup>

It is thus apparent that certain of the types of evidence, all of the types of groups, and certain of the countries represented by studies of the relation between delinquency and mental inferiority and studies of the relation between moral character and intelligence are mutually exclusive, that studies in delinquent groups are much more representative geographically than studies in non-delinquent groups, and that the two investigations by the author in non-delinquent groups are comparable and readily classifiable with the corresponding studies by many investigators.

## SECTION 2

### A COMPARISON OF THE THREE PARTS OF THE RESEARCH AS TO CORRELATIONAL RESULTS

The necessary data for the present comparison were derived from studies of the relation between moral character and intelligence presented in Part IB, Part II, and Part III of the research.<sup>4</sup>

<sup>3</sup> One type of evidence, namely, Ratings as to Abstract and Social Intelligence, contributed by the investigation of the relation between moral and intellectual traits, however, being in reality a combination of two other types.

<sup>4</sup> Since only studies of the relation between delinquency and mental inferiority are represented in Part IA, this division of the research could not be included in the comparison.

TABLE XXVIII  
A COMPARISON OF THE THREE PARTS OF THE RESEARCH AS TO CORRELATIONAL RESULTS

NON-DELINQUENT									
TYPE OF EVIDENCE	TYPE OF GROUP AND COUNTRY	CORRELATIONAL RESULTS							
		TOTAL POPULATION <sup>a</sup>	NO. AND TYPE OF COEFFICIENTS	SINGLE COEFFICIENT, WEIGHTED MEAN, OR WEIGHTED QUARTILE POINTS <sup>b</sup> (q <sub>1</sub> AND q <sub>3</sub> )	TOTAL POPULATION	NO. AND TYPE OF COEFFICIENTS <sup>c</sup>	PART II		
							MEDIAN	Q <sub>1</sub>	AND Q <sub>3</sub>
PART I B									
Ratings as to Intelligence Ratings as to Abstract Intelligence	College Students United States	1,194	42 <i>p</i>	.52	1,570	43 <i>p</i>	.25	... .39	
		2,342	20 <i>r</i>	.52 ... .64					
Ratings as to Social Intelligence	College Students United States	398	14 <i>p</i>	.52	1,467	40 <i>p</i>	.14	... .43	
		1,332	14 <i>r</i>	.43 ... .62					
Reports of Educational Status Reports of Educational Achievement	College Students United States	174	6 <i>p</i>	.35	277	10 <i>p</i>	.16	... .48	
		1,829	11 <i>r</i>	.30 ... .71					
Reports of Extra-Curricular Activities	College Students United States	76	1 <i>r</i>	.32	213	6 <i>p</i>	-.16	...+.45	

Results of Intelligence Tests Results of Tests of Verbal Abstract Intelligence	School Children United States	PART I B			PART III			
		87 [5,822]	3 $\rho$ 53 $r$	.20 ... .33	1,827	14 $r$	.30	.16 ... .40

<sup>a</sup> Throughout the table the number tabulated is the gross number of cases represented by all the coefficients opposite the number in question, regardless of any duplication that may have occurred in the subjects for these coefficients.

The number in brackets was supplied in part in accordance with a routine procedure, which required that a reasonable population be inferred from the nature of the subjects for the group in question in those instances in which the number of cases for a particular group was not given in the original source.

<sup>b</sup> The method of weighting used for the comparison was quantitative. In the three divisions of the research the weight applied to each coefficient corresponded to the number of cases represented by the coefficient in question, this number being taken as the frequency of that coefficient in the calculation of the weighted mean or of the weighted quartile points.

<sup>c</sup> Since the coefficients of correlation represented in the two investigations by the author were calculated between alternate halves of the data in the case of Part II, and, with a single exception, from the two halves of the data for one measure and the undivided data for the other measure in the case of Part III, and since a mean of the resulting alternate coefficients was taken as the most satisfactory figure for comparative purposes, the figure given in the case of Part II represents the actual number of these mean coefficients, and in the case of Part III, the actual number of these mean coefficients plus the 1 raw coefficient.

Since the figures required for this comparison are thus to be found in three separate compilations,<sup>5</sup> a compact presentation of the results involved is desirable. Accordingly, Table XXVIII presents a comparison of the three parts of the research as to correlational results.

The table summarizes the correlational results for the different types of evidence, the different types of groups, and the one country for which comparable results are to be found in the three parts of the research, the particular information called for in this comparison including the total population, the number and type of coefficients, and the single coefficient, the weighted mean, or certain weighted quartile points, as appropriate.

The comparison of the three parts of the research as to correlational results presented in Table XXVIII discloses these facts:

(1) For College Students, United States, the correlational results for Part II of the research tend to be noticeably lower than the correlational results for Part IB in the case of Ratings as to Abstract Intelligence and Ratings as to Social Intelligence; to be slightly higher in the case of Reports of Educational Achievement when comparison is limited to the corresponding rank-difference coefficients of Part IB, but appreciably lower in this same instance when comparison is limited to the corresponding product-moment coefficients of Part IB; and to be appreciably lower in the case of Reports of Extra-Curricular Activities.

(2) For School Children, United States, the correlational results for Part III of the research, although more variable, in general are in very close agreement with the correlational results for Part IB in the case of Results of Tests of Verbal Abstract Intelligence.

It will thus be observed that the two investigations by the author reported in Parts II and III either are in substantial agreement with the studies by many investigators reported in Part IB, or are somewhat more conservative than these studies, in their findings as to the relation between morality and intellect.

<sup>5</sup> The figures for Part IB used in the comparison are taken from the tabulation which provides the compilation of the correlational results of studies of the relation between moral character and intelligence, presented in Chapter X, and for Parts II and III from Tables XXI and XXVII, which respectively present the compilations of the correlational results of studies of the relation between moral and intellectual traits and of studies of the relation between conduct and intelligence. Only uncorrected coefficients are used in the comparison, the coefficients for Part IB in general differing from those for Parts II and III, however, in that the latter with one exception represent the mean of two alternate coefficients.



## CHAPTER XXXI

### A SYNTHESIS OF THE SEVERAL INVESTIGATIONS OF THE RELATION BETWEEN MORALITY AND INTELLECT INCLUDED IN THE RESEARCH

IT WILL be recalled that the investigations of the relation between morality and intellect included in the three parts of the research have each in turn been synthesized, in order to make possible the formulation of general conclusions as to the relation between morality and intellect on the basis of the findings of each investigation. A logical extension of this process of synthesis to embrace the findings of the entire research similarly finds its justification in the opportunity for formulating general conclusions as to the relation between morality and intellect afforded by a summary of the findings of the research as a whole. Accordingly, this chapter provides a synthesis of the several investigations of the relation between morality and intellect included in the research.

The synthesis presented in the three sections of this chapter includes an explanation of the method of combining coefficients of correlation for all types of subjects, a compilation of the correlational results of investigations of the relation between morality and intellect, and a graphic interpretation of the correlational results of the research.

#### SECTION I

##### AN EXPLANATION OF THE METHOD OF COMBINING COEFFICIENTS OF CORRELATION FOR ALL TYPES OF SUBJECTS<sup>1</sup>

The procedures employed in combining the correlational results throughout the research were more or less arbitrary, and were dic-

<sup>1</sup> The explanation given in this chapter applies only to the syntheses of the several divisions of the research, as presented in the compilations of the

tated in the main by practical considerations. Chief among these considerations were the large number of coefficients which had been compiled or calculated, and the ensuing necessity of arriving at the general trend of the results.

The procedure for combining the correlational results for feeble-minded, delinquent, and non-delinquent groups for tabular presentation and consideration in the syntheses of the several investigations of the relation between morality and intellect included in the research called for separate compilations of the correlational results of the studies represented in the various tabular reviews, which should retain the classifications according to types of evidence, types of groups, countries, and types of coefficients, but should otherwise be concentrated as far as the heterogeneity of the data permitted. The procedure thus involved the calculation of appropriate and suitably weighted measures of the general trend of the coefficients for the various classifications of the data, only uncorrected coefficients being used in the calculations except in the rare instances in which corrected coefficients were not reported in the original source, unless, as in the case of the two investigations by the author, a double series of results representing both uncorrected and corrected coefficients were computed.

The additional procedure for combining these correlational results for tabular presentation and consideration in the final synthesis of the research took advantage of the compilations of correlational results for the different series of studies, but at the same time carried the concentration of results still further, to the extent warranted by the identity of types of evidence, types of groups, countries, and types of coefficients.

The rules followed in combining coefficients of correlation for all types of subjects in the investigations of the relation between morality and intellect included in this volume for use in the syntheses of the several divisions of the research, providing for feeble-minded and delinquent groups in the case of studies of the relation between delinquency and mental inferiority and for non-delinquent

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correlational results throughout the research or in the comparison of the three parts of the research as to correlational results given in the preceding chapter. For further information regarding the method of combining the correlational results for Parts II and III, the explanations of the method of combining coefficients of correlation for college students and for school children given in Chapters XXII and XXIX should be consulted.

groups in the case of studies of the relation between moral character and intelligence, may be formulated as follows:

1. Do not combine coefficients for different types of evidence, for different types of groups, for different countries, nor for different types of coefficients.

2. Calculate weighted means for coefficients for the same type of group and country if the circumstances under which the coefficients were obtained and the selection of the subjects appear to justify this procedure.<sup>2</sup>

3. Calculate weighted medians or weighted lower and upper quartile points<sup>3</sup> rather than weighted means under conditions which do not appear to justify the calculation of weighted means, as indicated below:

- a. In the case of coefficients obtained by the statistical reduction of the non-correlational studies, whenever the coefficients to be combined were calculated from data presented in the detailed tables of the tabular review of non-correlational studies in two or more tables or in two or more major divisions of a given table.

- b. In the case of coefficients of the same type obtained by the statistical reduction of the non-correlational studies and reported in the literature, originally presented in the research in separate tables.

- c. In the case of coefficients reported in the literature or in the two investigations by the author, whenever the coefficients to be combined were originally presented in the research in two or more tables or in two or more major divisions of a given table, or whenever the groups represented by the coefficients to be combined differed in selection in respect to chronological age, school grade, or college year.

4. In calculating the appropriate measure of the general trend of the coefficients, interpret all coefficients from the standpoint of the relation between delinquency and mental inferiority or from the standpoint of the relation between moral character and intelligence, as

<sup>2</sup> If the number of coefficients was only two, a weighted mean was calculated in any case. Any instance in the case of a given synthesis in which, owing to the heterogeneity of the groups combined, a weighted percentile point rather than a weighted mean would have been calculated except for the small number of coefficients is indicated by a footnote accompanying the compilation of correlational results.

<sup>3</sup> The weighted lower and upper quartile points were reported if the number of coefficients was four or more, and the weighted median if the number of coefficients was only three, except in the syntheses of the two investigations by the author, in which case the three weighted quartile points named were all reported, and (if the number of results warranted it) the weighted percentile points as well.

appropriate,<sup>4</sup> and weight each coefficient by the number of cases for the respective feeble-minded, delinquent, or non-delinquent group.<sup>5</sup>

The additional rule followed in combining the correlational results of these investigations for use in the final synthesis of the research was as follows:

5. Combine coefficients concerned with the relation between moral character and intelligence reported in the two investigations by the author with the coefficients concerned with this relationship presented in the reviews of studies by many investigators, provided they represent the same type of evidence, the same type of group, the same country, and the same type of coefficient.

The measures of the general trend of the coefficients obtained as a result of the operation of the five rules given above, in so far as they represent the results for the research as a whole,<sup>6</sup> will be presented in the compilation of the correlational results of investigations of the relation between morality and intellect which follows.

<sup>4</sup> Thus the signs of all coefficients preceded by an asterisk in the basic tables were changed before combining, in order to restrict consideration to the relationship under investigation.

<sup>5</sup> Omissions in the number of cases for these coefficients were supplied in accordance with a routine procedure, which required that a reasonable population be inferred from the nature of the data for the group in question in the case of coefficients of colligation obtained by the statistical reduction of the non-correlational studies, and from the nature of the subjects for the group in question in the case of coefficients reported in the literature. In the former case, omissions occurred in the number of cases represented by one or more percentages for feeble-minded or delinquent groups as originally reported from which these coefficients of colligation were calculated, and were supplied in connection with the calculation of the pooled percentages from which these coefficients were derived, in the manner explained in the first section of Chapter V. In the latter case, omissions occurred in the number of cases for one or more coefficients as originally reported, and were supplied in the process of combining the coefficients. In such instances, the rule followed in supplying omissions in the number of cases was to infer a population of 1000 for coefficients representing a general group of delinquents or the general population, and of 100 for specific delinquent or non-delinquent groups. Omissions in the number of cases supplied by either procedure are indicated by brackets enclosing the figure given for the total population in all compilations of correlational results.

In completing the process of weighting according to population, a qualifying word referring to one of the coefficients concerned was disregarded.

<sup>6</sup> The combined results for single divisions of the research obtained by the operation of the first four rules given above which were affected by the operation of the fifth rule have already been recorded separately in the comparison of the three parts of the research as to correlational results, presented in the preceding chapter.

SECTION 2

A COMPILATION OF THE CORRELATIONAL RESULTS OF  
INVESTIGATIONS OF THE RELATION BETWEEN  
MORALITY AND INTELLECT

Table XXIX presents a compilation of the correlational results of investigations of the relation between morality and intellect.<sup>7</sup>

The table has two major divisions, which serve to differentiate the various results according to the type of studies represented. These major divisions are designated as follows:

- A. Studies of the Relation between Delinquency and Mental Inferiority.<sup>8</sup>
- B. Studies of the Relation between Moral Character and Intelligence.<sup>9</sup>

The two major divisions of the table summarize the correlational results for the different types of evidence represented by studies in feeble-minded and delinquent groups in the one case, and by studies in non-delinquent groups in the other, the results for the different types of groups and the different countries being separately indicated, the particular information called for in this compilation including the total population, the number and type of coefficients,<sup>10</sup> and the single coefficient, the weighted mean, or certain weighted quartile points, as appropriate, these results (barring the negligible exceptions noted in the footnotes of the table itself) representing only uncorrected coefficients.

<sup>7</sup> A frequency distribution of the coefficients included in this compilation of correlational results for all divisions of the research will be found in Appendix IV, Sections 1 and 2.

<sup>8</sup> This division includes all studies in feeble-minded and delinquent groups reviewed under that classification in Part IA of the research.

<sup>9</sup> This division includes all studies in non-delinquent groups reviewed under that classification in Part IB of the research, and in addition the two investigations by the author reported in Parts II and III.

<sup>10</sup> Although no provision is made in the headings for a separate presentation of the different types of coefficients, by the simple device of confining all the coefficients of one type to a given row in the table in the case of each type of evidence, provision is made for conveniently studying the degree of relationship between morality and intellect by types of coefficients as well as by types of evidence, types of groups, and countries. It will be observed that the order of presentation of these types of coefficients throughout the table is uniform for all types of evidence, although limited in any one case to the particular types of coefficients represented by the combined results for that type of evidence, the order of presentation being as follows:  $\omega$ ,  $\eta$ ,  $r_t$ ,  $\rho$ , and  $r$ .

The compilation of the correlational results of investigations of the relation between morality and intellect presented in Table XXIX may be interpreted briefly as follows:

(1) The correlation between morality and intellect as found in the case of feeble-minded groups, delinquent groups, and non-delinquent groups is generally positive, but extremely variable.

(2) If the results for the three types of subjects are considered without reference to types of evidence, types of groups, countries, or types of coefficients, the general trend of the results obtained may be summarized in the following words:

(a) For feeble-minded groups, the correlation is clearly positive, and tends to be marked in degree.

(b) For delinquent groups, the correlation is usually positive, and tends to be low in degree.

(c) For non-delinquent groups, the correlation is clearly positive, and tends to be low or marked in degree.

In conclusion, therefore, it may be stated that the evidence as to the relation between morality and intellect presented in the research is in essential agreement, and indicates that a direct relation varying in degree from low to marked exists between morality and intellect in feeble-minded, delinquent, and non-delinquent groups in this country and abroad.<sup>11</sup>

In comment upon this conclusion, however, it should be pointed out, first, that any general statement of findings is likely to obscure specific relationships that are of more importance than mass results, and, secondly, that many factors have entered in to affect the degree of relationship found. Hence the final conclusion of the research must take into account a detailed analysis of the evidence and a consideration of the effect of these various factors.

<sup>11</sup> As explained in greater detail in a similar connection in Chapter VII, in the syntheses of studies of the relation between delinquency and mental inferiority and likewise generally throughout the appropriate sections of the research, regardless of the types of coefficients concerned, for the sake of convenience the degree of relationship revealed by a given type of coefficient is interpreted as *in feeble-minded groups* or *in delinquent groups*, according to the experimental group represented by the result in question, although for technical interpretive purposes coefficients of colligation calculated from data for feeble-minded and non-feeble-minded groups and coefficients of colligation and tetrachoric coefficients of correlation calculated from data for delinquent and non-delinquent groups call for a more precise phrasing which takes into account both the experimental and the control groups.

A COMPILATION OF THE CORRELATIONAL RESULTS OF INVESTIGATIONS OF THE RELATION BETWEEN MORALITY AND INTELLECT  
A. STUDIES OF THE RELATION BETWEEN DELINQUENCY AND MENTAL INFERIORITY

[illegible][illegible][illegible][illegible]

## B. STUDIES OF THE RELATIONSHIP BETWEEN MORAL CHARACTER AND INTELLIGENC.

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Topic	Landscape Data Summary														
	Land Use Metrics			Vegetation & Forest			Climate & Weather			Soil & Water Quality			Biodiversity & Ecosystem		
	Area (km²)	Percentage	Change (%)	Forest Type	Canopy Cover (%)	Species Richness	Temperature (°C)	Precipitation (mm)	Humidity (%)	Soil pH	Moisture (%)	Water Quality Index	Number of Species	Endemicity (%)	Threat Level
Tropical Rainforest	1,200,000	15.2%	+0.5%	Primary Forest	78%	120	28.5	2,500	85%	6.5	75%	8.2	150	10%	High
	800,000	10.1%	-0.2%	Secondary Forest	65%	85	27.0	1,800	80%	6.8	70%	7.8	100	5%	Medium
Temperate Deciduous Forest	500,000	6.3%	+0.1%	Deciduous Forest	60%	90	15.0	1,200	60%	5.5	60%	6.5	80	3%	Low
	300,000	3.7%	-0.1%	Coniferous Forest	70%	70	10.0	800	55%	5.0	55%	6.0	60	2%	Low
Mountainous Region	2,500,000	31.5%	+1.2%	Alpine Tundra	40%	50	5.0	500	40%	7.0	40%	5.0	30	1%	Medium
	1,800,000	22.5%	+0.8%	Subalpine Forest	55%	65	8.0	1,000	50%	6.0	50%	5.5	40	2%	Medium
Desert Region	1,000,000	12.5%	-0.3%	Savanna	30%	40	30.0	1,000	20%	8.0	20%	8.0	20	0.5%	High
	700,000	8.8%	-0.1%	Steppe	20%	30	25.0	800	15%	7.5	15%	7.5	15	0.2%	High
Coastal Region	600,000	7.5%	+0.4%	Mangrove Forest	85%	110	25.0	2,000	90%	6.0	80%	7.5	120	8%	Medium
	400,000	5.0%	+0.2%	Seagrass Bed	90%	130	20.0	1,500	85%	6.2	75%	8.0	140	12%	Medium
Urban & Suburban	300,000	3.8%	+0.1%	Parkland	50%	70	18.0	1,500	70%	6.0	65%	6.5	90	4%	Low
	200,000	2.5%	-0.05%	Urban Green Space	40%	60	15.0	1,200	65%	5.8	60%	6.2	70	3%	Low
Polar Region	1,500,000	18.8%	+0.3%	Tundra	35%	45	0.0	300	30%	6.5	30%	6.5	25	0.1%	Medium
	1,000,000	12.5%	+0.1%	Ice Sheet	10%	10	-10.0	100	10%	7.0	10%	7.0	10	0.0%	High
Mountainous Region	2,000,000	25.0%	+0.9%	Alpine Tundra	40%	50	5.0	500	40%	7.0	40%	5.0	30	1%	Medium
	1,500,000	18.8%	+0.7%	Subalpine Forest	55%	65	8.0	1,000	50%	6.0	50%	5.5	40	2%	Medium
Desert Region	1,000,000	12.5%	-0.3%	Savanna	30%	40	30.0	1,000	20%	8.0	20%	8.0	20	0.5%	High
	700,000	8.8%	-0.1%	Steppe	20%	30	25.0	800	15%	7.5	15%	7.5	15	0.2%	High
Coastal Region	600,000	7.5%	+0.4%	Mangrove Forest	85%	110	25.0	2,000	90%	6.0	80%	7.5	120	8%	Medium
	400,000	5.0%	+0.2%	Seagrass Bed	90%	130	20.0	1,500	85%	6.2	75%	8.0	140	12%	Medium
Urban & Suburban	300,000	3.8%	+0.1%	Parkland	50%	70	18.0	1,500	70%	6.0	65%	6.5	90	4%	Low
	200,000	2.5%	-0.05%	Urban Green Space	40%	60	15.0	1,200	65%	5.8	60%	6.2	70	3%	Low
Polar Region	1,500,000	18.8%	+0.3%	Tundra	35%	45	0.0	300	30%	6.5	30%	6.5	25	0.1%	Medium
	1,000,000	12.5%	+0.1%	Ice Sheet	10%	10	-10.0	100	10%	7.0	10%	7.0	10	0.0%	High

1. The first step in the analysis is to identify the variables that are being measured. In this case, the variables are the number of people who are employed, the number of people who are unemployed, and the number of people who are not in the labor force. The second step is to determine the relationship between these variables. The third step is to calculate the unemployment rate, which is the number of unemployed people divided by the total number of people in the labor force. The fourth step is to interpret the results of the calculation. The fifth step is to compare the results to other data or to a theoretical model. The sixth step is to draw conclusions from the analysis. The seventh step is to communicate the results of the analysis to others. The eighth step is to evaluate the quality of the analysis. The ninth step is to revise the analysis if necessary. The tenth step is to complete the analysis.

#### B. STUDIES OF THE RELATION BETWEEN MORAL CHARACTER AND INTELLIGENCE

\* The limits of the step intervals for the ranges beginning at 00 or above should be interpreted as extending to  $\infty$  (00 to  $+\infty$ ), and so on, and for those beginning below 00, as extending from  $-\infty$  to  $-00$ , and so on.



### SECTION 3

#### A GRAPHIC INTERPRETATION OF THE CORRELATIONAL RESULTS OF THE RESEARCH

As indicated in the preceding section, an interpretation of the correlational results of the research which fails to take into account their constituent elements may obscure relationships of greater significance than those revealed. At the same time, the great variety of evidence assembled and the divergence in the results bespeak a visual aid to any detailed analysis. Accordingly, Table XXX presents a graphic interpretation of the correlational results of the research.

This table was constructed from the weighted means, medians, or lower and upper quartile points,<sup>12</sup> or if necessary from the single coefficients, for the different types of evidence, types of groups, countries, and types of coefficients, as given in the compilation of the correlational results of investigations of the relation between morality and intellect presented in Table XXIX.

The table has two major divisions, which correspond to the two principal divisions in Table XXIX. These major divisions are designated as follows:

- A. Studies of the Relation between Delinquency and Mental Inferiority.
- B. Studies of the Relation between Moral Character and Intelligence.

The two major divisions of the table show the type and the degree of relationship revealed by the correlational results for the different types of evidence represented by studies in feeble-minded and delinquent groups in the one case, and by studies in non-delinquent groups in the other, the results for the different types of groups, the different countries, and the different types of coefficients being separately indicated, and the general and the detailed classification of each series of results being given. Accordingly,

<sup>12</sup> Since in order to facilitate the classification of these combined results a single figure was desired to represent the general trend of the coefficients in each case, in the instances in which weighted lower and upper quartile points rather than weighted means or medians were provided, for classificatory purposes only the mid-point of these quartile points was taken as a rough measure of central tendency. It will be noted that in certain instances this mid-point chanced to fall on the line separating two classes of coefficients rather than within the limits of a single class.

the appropriate measure of the general trend of the correlational results in each case is classified as positive or negative, and as negligible, low, marked, or high, the finer gradations in degree also being distinguished in accordance with the detailed schedule used in interpreting the correlational results throughout the research, which is reproduced in the key to the classification of coefficients given at the foot of the table.

The graphic interpretation of the correlational results of the research presented in Table XXX may be analyzed in terms of the principal methods of classification employed throughout the research, namely, types of evidence, types of groups, countries, and types of coefficients. The four analyses suggested will be undertaken in order. To insure a proper evaluation of these analyses, however, it is necessary at the outset to point out that, owing to the nature of the facts upon which it is based, this graphic interpretation is concerned only with the general trend of the great mass of results represented in the compilation of the correlational results for the research as a whole.<sup>13</sup>

### *An Analysis of the Correlational Results in Terms of Types of Evidence*

An analysis of the evidence as to the relation between delinquency and mental inferiority in terms of types of evidence follows:

(1) Extreme variation is to be noted in the range of the correlational results for the different types of evidence represented by feeble-minded and delinquent groups, and usually considerable variation in the degree of relationship found for a particular type. The inclusive range of the results given in the table for all types of evidence represented by feeble-minded and delinquent groups is from somewhat marked and negative to extremely high and positive.

(2) In consequence of greatly varying results for the different types of evidence represented by feeble-minded and delinquent

<sup>13</sup> It will be recalled that Table XXIX, from which Table XXX is derived, was constructed from the weighted means or weighted quartile points of the original coefficients, unless single coefficients only were available, and that these results determined the classification of coefficients as given in the latter table. Consequently, the inclusive range of the results as given in these analyses may be less than the total range of the original coefficients, which may be ascertained by reference to Appendix IV, in which an analysis of the individual coefficients tabulated in the three parts of the research is presented. Furthermore, all the coefficients representing a combined result are credited as falling under the classification to which the combined result is assigned.

groups, the important concentrations of data are widely distributed, although a marked concentration under the classifications negligible or low is apparent in six of the ten instances. The most significant features of the distributions for the various types of evidence are given below:

(a) In the case of Reports concerning Delinquency, nearly one-half of the entries, more than two-thirds of the cases, and nearly one-half of the coefficients are classified as marked, whereas more than one-third of the entries and more than one-third of the coefficients are classified as high.

(b) In the case of Estimates of Mental Deficiency, more than one-half of the entries, more than five-sixths of the cases, and nearly one-fifth of the coefficients are classified as high, whereas more than two-thirds of the coefficients are classified as low.

(c) In the case of Reports of Illiteracy, more than one-half of the entries, nearly two-thirds of the cases, and more than one-half of the coefficients are classified as low, whereas more than one-third of the cases are classified as negligible.

(d) In the case of Reports of Amount of Schooling, more than one-half of the entries, practically all of the cases, and nearly two-thirds of the coefficients are classified as low.

(e) In the case of Reports of School Progress, one-fourth of the entries, practically all of the cases, and more than one-half of the coefficients are classified as marked, whereas one-half of the entries are classified as negligible.

(f) In the case of Reports of Educational Achievement, approximately one-half of the data is classified as negligible, and the remainder as marked.

(g) In the case of Results of Tests of Verbal Abstract Intelligence, more than one-fifth of the entries, nearly four-fifths of the cases, and nearly two-fifths of the coefficients are classified as marked, whereas more than one-third of the entries are classified as low, and more than one-third of the coefficients as negligible.

(h) In the case of Results of Army Mental Tests, one of the two entries, practically all of the cases, and one-half of the coefficients are classified as negligible, whereas the other entry, the remaining cases, and the other half of the coefficients are classified as low.

(i) In the case of Results of Tests of Non-Verbal Concrete Intelligence, two-thirds of the entries, nearly one-half of the cases, and nearly three-fourths of the coefficients are classified as negligible, whereas more than one-half of the cases are classified as low.

(j) In the case of Results of Tests of Mechanical Intelligence, approximately one-half of the data is classified as low and negative, and the remainder as negligible.

A similar analysis of the evidence as to the relation between moral character and intelligence is given below :

(1) Comparatively little variation is to be noted in the range of the correlational results for the different types of evidence with relatively adequate data represented by non-delinquent groups, and likewise usually in the degree of relationship found for a particular type. The inclusive range of the results given in the table for the different types of evidence represented by non-delinquent groups is from practically negligible to fairly high.

(2) In spite of somewhat varying results for the different types of evidence represented by non-delinquent groups, a marked concentration of data under the classification low is apparent in eight of the nine instances. The most significant features of the distributions for the various types of evidence are given below :

(a) In the case of Ratings as to Abstract Intelligence, more than one-half of the entries, nearly one-half of the cases, and nearly three-fourths of the coefficients are classified as marked.

(b) In the case of Ratings as to Social Intelligence, three-fifths of the entries, practically three-fifths of the cases, and more than three-fourths of the coefficients are classified as low.

(c) In the case of Ratings as to Abstract and Social Intelligence, the single entry, and hence the total number of cases and the total number of coefficients, are classified as low.

(d) In the case of Reports of Amount of Schooling, one of the two entries, nearly five-sixths of the cases, and two-thirds of the coefficients are classified as low, whereas the other entry is classified as negligible.

(e) In the case of Reports of School Progress, the single entry, and hence the total number of cases and the total number of coefficients, are classified as low.

(f) In the case of Reports of Educational Achievement, one-half of the entries, nearly two-thirds of the cases, and practically four-fifths of the coefficients are classified as low, whereas the remaining half of the entries are classified as marked.

(g) In the case of Reports of Extra-Curricular Activities, the three entries, and hence the total number of cases and the total number of coefficients, are classified as low.

(h) In the case of Results of Tests of Verbal Abstract Intelligence, one-half of the entries, nearly four-fifths of the cases, and more than three-fourths of the coefficients are classified as low, whereas the remaining half of the entries are classified as negligible.

(i) In the case of Results of Tests of Mechanical Intelligence, the single entry, and hence the total number of cases and the total number of coefficients, are classified as low.

*An Analysis of the Correlational Results  
in Terms of Types of Groups*

An analysis of the evidence as to the relation between delinquency and mental inferiority in terms of types of groups follows:

(1) Very little variation is to be noted in the range of the correlational results for the different feeble-minded groups with relatively adequate data, although considerable variation may be apparent in the degree of relationship found for a particular type. The inclusive range of the results given in the table for all feeble-minded groups is from rather low to very high, whereas the range of these results for the types of groups with multiple entries is as follows:

(a) For General Feeble-Minded Population, from rather low to very high.

(b) For Feeble-Minded Persons in Institutions, from rather low to very high.

(c) For Feeble-Minded Children in Public Schools, from well marked to very high.

(2) Probably because of the small number of entries for the different feeble-minded groups, a marked concentration of data is scarcely apparent in these instances, the classification marked, however, being somewhat more important than the classifications low and high.

(3) In partial contrast to the finding for feeble-minded groups, very great variation is to be noted in the range of the correlational results for the different delinquent groups, and usually considerable variation in the degree of relationship found for a particular type. The inclusive range of the results given in the table for all delinquent groups is from somewhat marked and negative to extremely high and positive, whereas the range of these results for the different types of groups is as follows:

(a) For Adult Criminals, from somewhat marked and negative to very high and positive.

(b) For Juvenile Delinquents, from very low and negative to fairly high and positive.

(c) For Sex Offenders, from practically negligible but positive to very high and positive.

(d) For Alcoholics, from somewhat marked and positive to extremely high and positive.

(4) In consequence of the decided variation in the results for the different delinquent groups, the primary concentrations of data under the classification low for the first two types of groups are more or less offset by secondary concentrations below and above this central group, and the primary concentration under the classification high for the third type of group is reduced in importance by a con-

tradictory secondary concentration; at the same time, the meager results for the fourth type of group agree in falling under the higher classifications.

A similar analysis of the evidence as to the relation between moral character and intelligence is given below:

(1) Considerable variation is to be noted in the range of the correlational results for the different non-delinquent groups with relatively adequate data, while considerable variation may also be apparent in the degree of relationship found for a particular type. The inclusive range of the results given in the table for all non-delinquent groups is from practically negligible to fairly high, whereas the range of these results for the types of groups with multiple entries is as follows:

(a) For College Graduates, from fairly low to somewhat marked.

(b) For College Students, from practically negligible to decidedly marked.

(c) For School Children, from practically negligible to fairly high.

(2) In spite of considerable variation in the results for the different non-delinquent groups, the only important concentrations of the data for the three types of groups with multiple entries are confined to the two classifications low and marked. At the same time, no marked concentration of data is discernible in the results for the types of groups with single entries, one each of these four types of groups being classified as negligible, low, marked, and high.

#### *An Analysis of the Correlational Results in Terms of Countries*

An analysis of the evidence as to the relation between delinquency and mental inferiority in terms of countries follows:

(1) Considerable variation is to be noted in the range of the correlational results for the countries with relatively adequate data represented by feeble-minded and delinquent groups, while very great variation may be apparent in the degree of relationship found for a particular country. The range of the results given in the table for the countries with multiple entries is as follows:

(a) For the United States, from very low and negative to very high and positive.

(b) For Great Britain, from somewhat marked and negative to extremely high and positive.

(c) For Germany, from practically negligible but negative to fairly high and positive.

(2) Doubtless as a partial consequence of the decided variation in the results for the countries represented by feeble-minded and delinquent groups, a marked concentration of data is scarcely apparent in the results for the three countries with multiple entries, the classifications low or negligible, however, being more important than the classifications marked or high. Furthermore, no marked concentration of data is discernible in the results for countries represented individually or in combination by single entries, the data being classified as negligible in one case, low in four cases, marked in two cases, and high in four cases.

A similar analysis of the evidence as to the relation between moral character and intelligence is given below :

(1) Complete correspondence is to be noted in the range of the correlational results for the countries with relatively adequate data represented by non-delinquent groups, although considerable variation is apparent in the degree of relationship found for a particular country. The range of the results given in the table for the countries with multiple entries is as follows :

For the United States, and likewise for Great Britain, from practically negligible to fairly high.

(2) In spite of some variation in the results for countries represented by non-delinquent groups, the only important concentrations of the data for the two countries with multiple entries are confined to the two classifications low and marked. At the same time, the data for the combined countries represented by a single entry are classified as low.

#### *An Analysis of the Correlational Results in Terms of Types of Coefficients*

An analysis of the evidence as to the relation between delinquency and mental inferiority in terms of types of coefficients follows :

(1) With one very important exception, in which instance extreme variation may be observed, very little variation is to be noted in the range of the correlational results for the different types of coefficients represented by feeble-minded and delinquent groups, while comparatively little variation is usually apparent in the degree of relationship found for a particular type. The range of the results given in the table for the different types of coefficients is as follows :

(a) For coefficients of colligation, from somewhat marked and negative to extremely high and positive.

(b) For correlation ratios, from very low and negative to rather low and positive.

(c) For tetrachoric coefficients of correlation, from practically negligible but negative to rather low and positive.

(d) For rank-difference coefficients of correlation, from practically negligible but positive to rather low and positive.

(e) For product-moment coefficients of correlation, from very low and negative to very low and positive.

(2) In consequence of the extreme variation in the results for feeble-minded and delinquent groups shown by the first type of coefficient, the primary concentration of data under the classification low is outweighed by important secondary concentrations under each of the classifications marked and high; notwithstanding, owing to the consistency in the results shown by the remaining four types, a marked concentration of data under one or the other of the classifications negligible and low is apparent in these instances.

A similar analysis of the evidence as to the relation between moral character and intelligence is given below:

(1) Very little variation is to be noted in the range of the correlational results for the different types of coefficients represented by non-delinquent groups, although considerable variation may be apparent in the degree of relationship found for a particular type. The range of the results given in the table for the different types of coefficients is as follows:

(a) For tetrachoric coefficients of correlation, from rather low to fairly high.

(b) For rank-difference coefficients of correlation, from very low to fairly high.

(c) For product-moment coefficients of correlation, from practically negligible to fairly high.

(2) In spite of more or less variation in the results for the types of coefficients represented by non-delinquent groups, the more important concentrations of the data are to be found under one or both of the classifications low and marked in the three instances.

In summary, then, it may be said that the analyses of the correlational results in terms of types of evidence, types of groups, countries, and types of coefficients show a preponderance of the data falling under one or more of the classifications negligible, low, and marked, whether feeble-minded, delinquent, or non-delinquent groups are under consideration, with the more important data for feeble-minded groups tending to show a marked degree of relationship, for delinquent groups a low or negligible degree of relationship, and for non-delinquent groups a low or marked degree of relationship, between morality and intellect.



## CHAPTER XXXII

### A CONSIDERATION OF VARIOUS FACTORS WHICH AFFECT THE CORRELATIONAL RESULTS OF THE RESEARCH

IT IS evident that the compilation of the correlational results presented in the preceding chapter, even when supplemented by the graphic interpretation of these results presented in the same chapter, does not permit the formulation of a very definite conclusion as to the relation between morality and intellect. Before the findings of these two presentations can be utilized in formulating the final conclusion of the research, a consideration of various factors which affect the correlational results of the research is essential. This, then, is the task of the present chapter.<sup>1</sup>

In the consideration to which the three sections of this chapter are devoted several analyses concerned with factors which have been particularly active in influencing the degree of relationship found in the research are required, as follows: (1) an analysis of the effect of different types of subjects; (2) an analysis of the effect of different types of evidence, types of groups, countries, and types of coefficients; and (3) an analysis of the effect of chance inaccuracies in the original measures. These three analyses will be undertaken in order in the succeeding sections.

#### SECTION I

##### AN ANALYSIS OF THE EFFECT OF DIFFERENT TYPES OF SUBJECTS<sup>2</sup>

The recognition that the problem of the relation between morality

<sup>1</sup>This general discussion, which applies to the research as a whole, requires supplementation by the critical examination of the coefficients presented in the individual tables with reference to various factors which affect the correlational results, as given in preceding chapters. Specific reference to these discussions will be made as appropriate in this chapter.

<sup>2</sup>In the case of correlational results calculated from fourfold tables, in-

and intellect is twofold, involving the relation between delinquency and mental inferiority and the relation between moral character and intelligence, has led to the inclusion of several different types of subjects in the research, namely, feeble-minded and delinquent groups in the investigation of the first relationship concerned, and non-delinquent groups in the investigation of the second.

Because of the influence of the factor of selection upon the degree of relationship found, the present analysis must seek to determine the extent to which the three types of subjects included in the research constitute selected groups, either in comparison with the population as a whole or in comparison with each other, and the effect, if any, which this selection may be expected to have upon the correlational results. Attention is called to the very great importance of the influence suggested in a caution voiced by Pearson in the following quotation taken from his article on the influence of natural selection on the variability and correlation of organs:

"We must always bear in mind this all-important fundamental conception, that natural or artificial selection, or even random sampling, are in themselves active factors in the modification (*i.e.*, creation, destruction, or reversal) of correlation." (174, p. 29)

To consider the effect of different types of subjects upon the correlational results of the research, then, is the purpose of the comparison of feeble-minded, delinquent, and non-delinquent groups with respect to restriction in range which follows.

*A Comparison of Feeble-Minded, Delinquent, and Non-Delinquent Groups with Respect to Restriction in Range*<sup>3</sup>

In this comparison the two types of subjects represented by studies of the relation between delinquency and mental inferiority

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cluding coefficients of colligation obtained by the statistical reduction of the non-correlational studies or reported in the literature, and tetrachoric coefficients of correlation, only the experimental groups represented will be taken into consideration in this analysis.

<sup>3</sup> It should be noted at the outset that in this comparison only the very general features of the problem of selection will be considered, and no attempt will be made to point out the peculiarities of selection which have characterized individual groups represented in the research, as indicated in the facts concerning these groups given in the presentations of the original coefficients throughout the research and the accompanying interpretations, unless such peculiarities have wide application.

may profitably be considered together,<sup>4</sup> prior to a consideration of the type of subject represented by studies of the relation between moral character and intelligence.

An examination of the data considered in the research clearly indicates that feeble-minded and delinquent groups represent a very small percentage of the total population.<sup>5</sup> Thus reference to the crucial percentages for Reports concerning Delinquency<sup>6</sup> shows that, with one exception,<sup>7</sup> the highest percentage delinquent given in this instance for any non-feeble-minded group, whether classified as General Population, Children of Delinquency Age, or School Children, is 3.3. Similarly, reference to the crucial percentages for Estimates of Mental Deficiency and Earlier Results of Tests of Verbal Abstract Intelligence<sup>6</sup> shows that the highest percentage mentally deficient and the highest percentage intellectually deficient<sup>8</sup> given in these two instances for any non-delinquent

<sup>4</sup>In this connection it is of interest to note that a change in the type of subject from feeble-minded groups to delinquent groups in the case of coefficients of colligation between measures of delinquency and mental inferiority obtained by the statistical reduction of the non-correlational studies appeared to be accompanied by an appreciable decrease in the degree of relationship found, as already pointed out in connection with the interpretation of Table I.

<sup>5</sup>Since a curtailment in the distribution is likely to follow as a natural corollary of limited representation, in this discussion facts cited to show that a given group represents a very small proportion of the population will generally be taken to signify that the group in question is restricted in range, although it is recognized that facts such as these do not necessarily give any information as to the rigorousness of the selection.

<sup>6</sup>These percentages are arranged for convenient reference in the abbreviated tabulations of crucial percentages derived from the tabular review of non-correlational studies presented in a separate monograph (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Appendix, Section 4).

It should be added that the precise meaning of the crucial percentages cited or of any other crucial percentages in the abbreviated tabulations referred to can best be determined by reference to the corresponding detailed tables of the tabular review of non-correlational studies, also presented in the monograph named above.

<sup>7</sup>As certain information given in the interpretation of the table presenting the type of evidence under consideration in the monograph referred to above indicates, the exceptional percentage mentioned is scarcely comparable with the other crucial percentages for non-feeble-minded groups for Reports concerning Delinquency (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chap. 2).

<sup>8</sup>The measures of mental inferiority referred to were chosen for consideration in the present connection, first, because they correspond most closely to the concept of feeble-mindedness in the public mind which was doubtless operative in the selection of a majority of the feeble-minded groups represented in studies of the relation between delinquency and mental in-

group, whether classified as General Population or as School Children, are, respectively, 2.0 and 3.8.

Moreover, the figures cited suggest the further interesting fact that feeble-minded groups tend to represent about the same percentage of the total population as delinquent groups. This finding is in accord with a suggestion made by Hoag and Williams in their book *Crime, Abnormal Minds, and the Law* on the basis of somewhat more conservative figures than the maximum figures given above, as follows:

"... about two per cent. of the community is constantly criminal the world over and ... no matter what we do, no appreciable effect has ever been produced upon this average of criminality.

"... figures ... in respect to crime are significantly related to those now available and verifiable in regard to mental defectiveness, namely, that the proportion of the *mentally defective* to the general population *is about two per cent.*" (53, pp. 7-9)

For the purposes of this comparison, the question of the extent to which the types of subjects represented by studies of the relation between delinquency and mental inferiority constitute selected groups can be satisfactorily answered without taking into consideration the several types of feeble-minded and delinquent groups, since the percentage of the population involved in any case is very small. This is not true, however, of the type of subjects represented by studies of the relation between moral character and intelligence, for the reason that the various types of non-delinquent groups considered in the research are markedly diverse. Thus the types of groups included are General Population, which is wholly unrestricted; Royalty, which is definitely selected but not necessarily restricted in range, although the two terms are

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inferiority, and, secondly, because there are numerous complicating factors entering into much of the other data considered in the research which are presumably more or less diagnostic of feeble-mindedness. It should be noted, however, that the more objective types of evidence utilized in the research in some instances give figures for relatively unselected non-delinquent groups which are higher than either of those cited above, but which may nevertheless be regarded as the percentage presumably characterized by mental deficiency or the percentage presumably characterized either by mental deficiency or by borderline intelligence in the groups in question. For further information on this point the crucial percentages for other types of evidence, also included in the abbreviated tabulations referred to above, together with the corresponding detailed tables, should be consulted.

usually synonymous; Aviation Cadets, which presumably represent a much higher type of selection than ordinary recruits; College Graduates, College Students, and School Children, three scholastic groups which differ greatly with respect to the degree of restriction in range; and Boy Scouts, which are usually recruited from School Children, although much more highly selected than this type of group. On the other hand, the question under consideration is of importance only in the case of the types of non-delinquent groups with multiple entries, and specific discussion may therefore be limited to the following three types: College Graduates, College Students, and School Children.<sup>9</sup>

It is interesting to note that College Graduates possibly represent about the same percentage of the population as feeble-minded and delinquent groups. This statement is based on the following quotation taken from the bulletin prepared by the United States Bureau of Education reporting statistics of universities, colleges, and professional schools for 1917-18, supplemented by the three succeeding quotations, which also give statistics for College Graduates:

"... an attempt has been made to secure an approximate statement concerning the number of college graduates in the United States in 1918. . . . From the statistical reports of the Commissioner of Education the number of graduates receiving their first degrees from universities, colleges, technological schools, and professional schools has been ascertained for each year since 1870. . . . The total number of students graduating from college from 1870 to 1918, inclusive, is 1,058,527. Of this number, 908,469 are estimated to be living in 1918. . . .

"The estimated total population in 1918 is 105,253,300. There is, therefore, one college graduate living to-day for every 116 persons in the total population. If only the population 23 years of age and over is considered, the ratio becomes 1 college graduate to every 61 adults."<sup>10</sup> (200, pp. 28, 30)

<sup>9</sup> Although data bearing upon the problem of the restriction in range of different types of groups are cited only for the United States in the discussion which follows, it should be noted that Great Britain is also represented in the research by two of the types of groups to be considered, namely, College Students and School Children, the number of coefficients reported in this case, however, being much smaller.

<sup>10</sup> In spite of various considerations discussed in the context which have entered in to affect the estimate, the conclusion reached with reference to the figures on which the estimate is based is as follows: "It is believed . . . that for all practical purposes the table presents reliable statistics on the number of college graduates living in 1918." (200, p. 28)

Although College Students are not so highly selected as College Graduates, whether comparison is made with the population of the corresponding ages or with the corresponding generation of school children entering the first grade, the narrowly restricted nature of both types of groups is evident from the following passages quoted from the bulletin already cited:

"A . . . conception as to attendance at colleges and universities may be gained by comparing the enrollment with the corresponding population which might be in college if all attended. . . . It is assumed that it takes four years to complete a college course, and that the most usual ages when young men and women attend college are from 19 to 23. . . . The total enrollment in all departments of universities, colleges, and professional schools has been compared with this age group. The . . . curve . . . varies from 3.3 per cent in 1898, when the smallest percentage of the population attended college, to 4.8 per cent in 1916, when the largest percentage attended. . . . In 1890 less than 1.3 per cent of the population 23 years of age was graduating from college. In 1916 almost 2.2 per cent of the population of this age received first degrees."<sup>11</sup> (200, pp. 18-20)

" . . . 139 pupils will graduate from a four-year high school for each 1,000 that entered the first grade 12 years earlier. . . . 72 out of these 139 high-school graduates will go to college. . . . 52 of these will become sophomores; 39, juniors; 30, seniors; and 23 will graduate. Thus it is seen that only 13.9 per cent of those entering the first grade will graduate from a four-year high school, and only 2.3 per cent of the original number will complete a college course."<sup>12</sup> (200, p. 31)

Moreover, the facts given in the preceding quotations, suitable for comparison with the study representing College Graduates, United States, and the earlier studies representing College Students, United States, included in the research, are in essential agreement with the following data cited by Alderman for the year 1924 in a chapter on adult education in the *Biennial Survey of*

<sup>11</sup> In connection with these figures, the following explanation is offered: "The number of first degrees includes first degrees granted by professional schools as well as baccalaureate degrees granted by universities, colleges, and technological schools." (200, p. 19)

<sup>12</sup> As qualifying the figures given above, these statements should be kept in mind: "Since a large percentage of seniors in college left in 1918 to answer war demands, it is highly probable that under normal conditions a much larger percentage of seniors graduate than is here indicated. . . . It should also be remembered that these . . . survival percentages do not represent special students or students enrolled in professional departments." (200, p. 32)

*Education, 1928-1930*, issued by the United States Office of Education:

"An estimate made by a student of educational statistics for the year 1924 showed the following percentage of distribution of 69,000,000 persons 21 years of age and over according to extent of education: Illiterate, 7.10; some elementary work, 34; completed elementary grades, 27.13; some high-school work, 18.86; high-school graduates only, 6.22; some college work, 4.55; college graduates, 2.14." (202, p. 421)<sup>13</sup>

As indicated in the quotations already cited, in the case of School Children a very different situation obtains. Theoretically, this type of group is almost as unrestricted in range as the general population. Moreover, the following information, supplied by the United States Bureau of Education in a bulletin reporting statistics of state school systems for 1925-26, clearly shows that practically all the children of school age throughout the country are actually enrolled in school:

"If the 2,438,725 pupils reported in private elementary and high schools are included with 24,741,468 enrolled in public schools, a total of 27,180,193 children were enrolled in public and private elementary and secondary schools during the school year 1925-26. This total enrollment is more than 90 per cent of the number estimated to be of school age."<sup>14</sup> (198, p. 2)

Although the percentage given for 1925-26 is doubtless somewhat higher than the percentages for earlier years covered by studies representing School Children, United States, included in the research, it is probably safe to assume from the following quotation, taken from the corresponding bulletin for 1917-18, that at this earlier period also the school children of the country constituted a fairly satisfactory cross-section of the general population:

<sup>13</sup> Replying to an inquiry regarding this estimate, in a personal letter dated October 23, 1933, Mr. Alderman says:

"... The source of this information is Mr. Emery Foster, Office of Education, Interior Department, Washington, D. C.

"The figures . . . are given as an estimate although they are probably as accurate as can be given, yet they are not subject to absolute proof."

In a personal letter dated November 4, 1933, Mr. Foster describes the data given by Mr. Alderman in the chapter referred to as "a special calculation I made for him for that purpose."

<sup>14</sup> In the bulletin referred to the number of children of school age, that is, the number between 5 and 17 years of age, inclusive, on July 1, 1926, in Continental United States was estimated to be 30,064,621 (cf. 198, p. 1).

"... only 17.8 per cent of the children of school age are not enrolled in either public or private elementary and secondary schools." (199, p. 6)

In spite of the situation revealed by these figures, however, reference to the facts concerning individual groups of school children, as given in the presentations of the original coefficients throughout the research and the accompanying interpretations, shows that in practically every instance the studies included are for selected groups. At the same time, the selective agencies operating in these instances are so numerous and varied that generalization as to the degree of restriction in range represented by School Children in this research would appear hazardous.

The fact of restriction in range having been sufficiently established for all types of subjects included in the research, it is important to consider briefly the manner of restriction and to specify the effect which it has upon the correlational results.

The most important selective factors in the case of the two types of subjects represented in studies of the relation between delinquency and mental inferiority are obviously mental inferiority in the case of feeble-minded groups and moral inferiority in the case of delinquent groups. Since the restriction in range in these instances is extreme, a very low correlation between morality and intellect, other things being equal, would doubtless be expected in studies in feeble-minded and delinquent groups. It should be noted, however, that in addition to the overt type of selection which takes place when feeble-minded or delinquent groups are chosen as subjects there is a subtle type of selection which goes on by virtue of the fact that these groups are usually not clearly defined in the population. This type of selection as applied to delinquent groups has been frequently noted in the literature. Thus in her monograph *A Comparative Study of the Intelligence of Delinquent Girls* Bronner voices the stock criticism of studies of the relation between delinquency and mental inferiority in these words:

"... it must be remembered that in all studies of delinquents, it is only the *caught* delinquent that is discussed." (15, p. 2)

This criticism calls attention to the fact, often overlooked, that the tendency of the more intelligent criminal to escape conviction gives rise to a constant error which, other things being equal,



tends to increase the degree of relationship between delinquency and mental inferiority found in studies in delinquent groups.

In the case of feeble-minded groups this same type of selection is likewise operative, in view of the fact that the data tabulated for these groups consist in the percentage delinquent, which because of the tendency of the more intelligent offender to escape detection as delinquent would be reported too high for feeble-minded groups in comparison with non-feeble-minded groups. As in studies in delinquent groups, the resulting constant error, other things being equal, would tend to raise the correlational results obtained. In contrast to this type of selection in feeble-minded groups, however, an analogous type of selection is to be found in the tendency of the more intelligent feeble-minded to escape recognition as mentally inferior. Since the feeble-minded who are recognized have less opportunity to become delinquent, by reason of special surveillance or commitment to an appropriate institution, than their unrecognized fellows, the factor under consideration acts in a reverse way, leading to a constant error which, other things being equal, would tend to lower the correlational results obtained. Although it is impossible to determine accurately the relative strength of the two factors operative in feeble-minded groups, it may safely be assumed that the first of these tendencies is much more potent than the second.<sup>15</sup> In these circumstances it is evident that the net result of these two tendencies presumably is to increase the degree of relationship between delinquency and mental inferiority found in studies in feeble-minded groups.

The most important selective factor in the case of the type of

<sup>15</sup> This assumption is based on an analysis of the sampling error which results from the two tendencies under consideration. In the latter case, the fact that the proportion of the feeble-minded in the population is very small, coupled with the fact that the better methods of evaluating intelligence and the wider use of intelligence tests which have become current within recent years decrease the number of the feeble-minded who are overlooked, makes it highly improbable that the number of the feeble-minded who are classified as non-feeble-minded will make any appreciable difference in the percentage delinquent reported for non-feeble-minded groups. In the former case, the fact that the proportion of the delinquent in the general population is very small, coupled with the fact that the present inadequate methods of apprehending delinquents do not act indiscriminately, but rather in such a way as to favor the more intelligent criminals, makes it inevitable that the number of the delinquent who are classified as non-delinquent will make a significant difference in the percentage delinquent reported for non-feeble-minded groups. The greater importance of the first factor in comparison with the second is therefore evident.

subject represented in studies of the relation between moral character and intelligence is undoubtedly mental superiority, affecting particularly two of the three non-delinquent groups with multiple entries, namely, College Graduates and College Students. But as mental inferiority is a complicating factor in the case of delinquent groups, so moral superiority is a complicating factor in the case of the non-delinquent groups named, since good moral character is frequently specified as a requirement for college entrance and its opposite may lead to expulsion. In spite of the fact that the precise effect of these interlocking factors is doubtless indeterminable on the basis of available facts, it is probably fairly safe to assume that this double selection with its attendant extreme restriction in range, other things being equal, tends to decrease the degree of relationship between moral character and intelligence found in studies in non-delinquent groups.

Although the third non-delinquent group with multiple entries, namely, School Children, clearly constitutes a much more representative sampling of the population than do College Graduates or College Students, it is nevertheless apparent that this type of group is subject in a measure to the same double selection that characterizes the scholastic groups previously discussed, since the more serious cases of feeble-mindedness and delinquency have presumably been committed to special institutions. Attention was earlier called to the fact, however, that a very small percentage of the general population is classed as feeble-minded or as delinquent. Since a similarly small percentage of school children would be so classed, the effect of this double selection in the present instance is doubtless negligible, and quite overshadowed by the peculiarities of selection already referred to as characteristic of many individual groups of this type. Possibly most important among these selective factors are differences in the grade or intelligence range and the chronological age of the subjects for the different studies represented in the research.<sup>16</sup>

Consideration of the remaining types of non-delinquent groups,

<sup>16</sup> A detailed analysis of the influence of chronological age under different circumstances is included in the interpretation of Table XXVI in Chapter XXVIII. Other selective factors affecting the correlational results for College Students and School Children reported in the two investigations by the author are discussed in connection with the detailed interpretations of Tables XIII–XV in Chapter XIX and Tables XXIV–XXVI in Chapters XXVI–XXVIII.

namely, General Population, Royalty, Aviation Cadets, and Boy Scouts, would appear to be unnecessary in view of their scant representation in the research. Nevertheless, it is worth while to call attention to the particular interest which attaches to the results for General Population, the only type of group represented in the research which may lay claim to being unselected.

Before the present discussion is concluded a number of points call for clarification or emphasis.

In the first place, in anticipation of a suggestion that a procedure for correcting for restriction in range has been devised and should have been applied in the present situation, it may be well to point out that an important formula for this purpose (cf. 154, pp. 223-28) provides for correction for restriction in range in the case of a single variable only, and requires that the spread of the distribution in the general population as well as in the particular group investigated be known. In his book *Statistical Method* Kelley prescribes the conditions under which such a procedure is applicable in the case of the correlation of two different series of measures, in the following passage:

"In case two different series of measures are correlated it is usually not known just what is the nature of the curtailment or extension of the ranges of the two series which has been brought about by some selective agency. . . . In such a case and without additional data a correction of the correlation as found in the one range to enable a comparison with a similar correlation as found in the second range is impossible. If, however, the nature of the curtailment is known and is upon the basis of one trait only we may derive a formula enabling a comparison of correlation coefficients obtained from different ranges. Note that one trait is arbitrarily curtailed (or extended) and that the other is affected only in a consequential manner." (154, pp. 223-24)

It is apparent that the conditions prescribed in this quotation are not met by the data of this research, in view of the dual nature of the restriction in range characteristic of the principal groups included, and the dearth of information as to the extent of the restriction, particularly on the moral side.<sup>17</sup> Moreover, although a procedure for correcting for restriction in range in the case of

<sup>17</sup> The use of some procedure for correcting for restriction in range was at one time contemplated by the author both in the case of the investigation of the relation between moral and intellectual traits and in the case of the investigation of the relation between conduct and intelligence. The project was finally abandoned in both instances, however, in view of the fact that

two variables is also available (cf. 154, pp. 228-30), this formula is likewise inapplicable in the present research, since feeble-minded and delinquent groups on the one hand and a majority of the non-delinquent groups included in the research on the other hand represent either the tail end of a normal distribution or a decidedly curtailed distribution. The precise requirements for the use of the formula in question are thus defined by Kelley in the book already referred to:

“... this formula applies when the selective agencies tend to select normal distributions whose means and standard deviations are different from those in the original distributions and does not apply in the case of sharp truncation of a normal correlation surface.” (154, p. 230, Note)

In the second place, it should be recognized that, although the purposes of the present discussion were presumably sufficiently served by pointing out the double selection more or less operative in the case of the three types of subjects included in the research, the fact of multiple selection could doubtless be established in the case of many of the individual groups which the three types of subjects represent.

In the third place, it is important to note that, although the statements as to the effect of different types of selection upon the correlational results have been qualified by the expression “other things being equal,” as a matter of fact the succeeding discussion of the effect of different types of evidence, types of groups, countries, and types of coefficients will effectively prove that other things were seldom equal in the course of the research.

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the subjects for these investigations were restricted in range in respect to both of the measures correlated.

In this connection it is of interest to note that in answer to a question as to the possible applicability to the investigation of the relation between conduct and intelligence of certain data which permit the “estimation of the true correlation between general intelligence scores and general achievement scores for a defined range of talent, knowing the correlation in a different range,” given in his book *Interpretation of Educational Measurements* (cf. 153, pp. 196-203), in a personal letter dated January 31, 1928, Professor Kelley replied as follows: “I would not advise using Table 27 of my text in case the variables are mental age and conduct score. You will notice that ... the difference between each grade mean and that of the grade just above is assumed to be the same number of standard deviations, whether the trait is general achievement or general intelligence. In other words the difference is  $k$  standard deviations in each instance. I do not believe this is a reasonable assumption to make when dealing with intelligence and conduct.”

Lastly, it is doubtless evident that the twofold approach to the problem of the relation between morality and intellect by way of studies of the relation between delinquency and mental inferiority and studies of the relation between moral character and intelligence, exemplified in the present research, derives its value in considerable measure from the fact that questions which arise concerning the validity of the observed relation in the case of one type of subject can often be answered best by reference to the observed relation in the case of another type of subject in which a different method of selection has operated.

In summary, then, it may be said that the comparison of feeble-minded, delinquent, and non-delinquent groups with respect to restriction in range calls attention to the marked influence of the factor of selection upon the correlational results, without however providing a remedy for its effect, and thus reveals the necessity of formulating any conclusion regarding the relation between morality and intellect in terms of restricted groups.

## SECTION 2

### AN ANALYSIS OF THE EFFECT OF DIFFERENT TYPES OF EVIDENCE, TYPES OF GROUPS, COUNTRIES, AND TYPES OF COEFFICIENTS

In the various analyses of the correlational results presented in the preceding chapter the fact was not considered that the degree of relationship found for a given type of evidence was dependent not only upon the type of evidence under consideration, but also upon the types of groups, the countries, and the types of coefficients which chanced to be represented in the particular instance; and that the degree of relationship found for a given type of group, a given country, or a given type of coefficient was likewise dependent upon the other three components represented.

Since neither on theoretical nor on practical grounds is it reasonable to assume that the degree of relationship found by the various studies represented in the tabular reviews and syntheses presented throughout the research would be even approximately equal, it becomes necessary at this time to consider a series of comparisons showing the order of magnitude of the correlational results according to the particular data involved.

The four comparisons required are for the different types of evidence, the different types of groups, the different countries, and the different types of coefficients, the other three components of the data being identical for each comparison.

The data available for these comparisons are the correlational results of the research as classified in Table XXX with the non-comparable data in any given instance eliminated. Unfortunately, even after such eliminations are made, the comparisons can not be fully satisfactory for three reasons: first, because the measure of morality employed, although often analogous to the measure of intellect employed, in so far as subjectivity or objectivity is concerned, was not the basic unit determining the classification according to types of evidence;<sup>18</sup> secondly, because the individual groups of which the various types of groups were constituted were rarely identical, with the result that peculiarities of selection in these individual groups may at times be of more importance than the factor under consideration;<sup>19</sup> and, thirdly, because the classification of the correlational results used in the comparisons was based on a more or less arbitrary measure of the general trend of these results rather than on the original coefficients, except in those instances in which but one coefficient was available.<sup>20</sup> These three marked restrictions upon the adequacy of the comparisons must be kept in mind throughout the discussion.

The four comparisons suggested above will now be considered in order.

*A Comparison of the Correlational Results for the Different  
Types of Evidence with Identical Types of Groups,  
Countries, and Types of Coefficients*

The present comparison is based on the individual comparisons of correlational results for all possible types of evidence with

<sup>18</sup> In the outline of procedure given in Chapter II, attention was called to the fact that the measures of intellect and the corresponding measures of morality were frequently similar in nature, and to the further fact that the classification according to types of groups in the case of delinquent groups is in part a classification according to the measure of morality employed, while one type of evidence is also classified on this basis.

<sup>19</sup> Attention will be called to the effect of peculiarities of selection and additional factors of more or less importance in the subsequent comparisons in the instances in which it appears to be necessary.

<sup>20</sup> The basis for classifying results in Table XXX is indicated in more detail in the introduction to the table in question.

identical types of groups, countries, and types of coefficients.<sup>21</sup>

An analysis of the seventy-three individual comparisons of correlational results possible for the types of evidence represented by delinquent groups<sup>22</sup> results in the order of magnitude from highest

<sup>21</sup> These individual comparisons of correlational results are possible by reference to the graphic interpretation of the correlational results of the research given in Table XXX. Summaries of the outcomes of the individual comparisons possible for the types of evidence represented by delinquent and by non-delinquent groups from which the orders of magnitude of the correlational results presented in the text were derived are given in footnotes accompanying the orders of magnitude in question. In explanation of these summaries it should be stated that, although the number of individual comparisons analyzed for the different types of evidence varies considerably, every comparison permitted by the data available has been utilized. All comparisons are made, as usual, on a scale from +1.00 to -1.00.

It may be added that, although no provision is made in the accompanying text for the order of magnitude of the correlational results for feeble-minded groups owing to the fact that but one type of evidence was represented in this case, the relative order of magnitude of Reports concerning Delinquency in comparison with other types of evidence will be considered in the subsequent discussion.

<sup>22</sup> The outcomes of the individual comparisons for delinquent groups are indicated in the following summary:

Estimates of Mental Deficiency are classified higher than Reports of Illiteracy, five times; higher than Reports of Amount of Schooling, five times; higher than Reports of School Progress, three times; higher than Reports of Educational Achievement, twice; higher than Results of Tests of Verbal Abstract Intelligence, four times; higher than Results of Army Mental Tests, twice; higher than Results of Tests of Non-Verbal Concrete Intelligence, once; and higher than Results of Tests of Mechanical Intelligence, once.

Reports of Illiteracy are classified with Reports of Amount of Schooling, twice,\* and lower than this type of evidence, twice; with reports of School Progress, twice,\* and lower than this type of evidence, twice; lower than Reports of Educational Achievement, once; higher than Results of Tests of Verbal Abstract Intelligence, once,\* and lower than this type of evidence, four times; higher than Results of Army Mental Tests, twice; higher than Results of Tests of Non-Verbal Concrete Intelligence, once; and higher than Results of Tests of Mechanical Intelligence, once.

Reports of Amount of Schooling are classified higher than Reports of School Progress, twice, with this type of evidence, once,\* and lower than this type of evidence, once\*; with Reports of Educational Achievement, once\*; higher than Results of Tests of Verbal Abstract Intelligence, once,\* and lower than this type of evidence, three times; higher than Results of Army Mental Tests, twice; higher than Results of Tests of Non-Verbal Concrete Intelligence, once; and higher than Results of Tests of Mechanical Intelligence, once.

Reports of School Progress are classified lower than Results of Tests of Verbal Abstract Intelligence, three times; higher than Results of Army

to lowest<sup>23</sup> shown in the following tabulation:<sup>24</sup>

DELINQUENT GROUPS	
Estimates of Mental Deficiency	
Reports of Educational Achievement	
Results of Tests of Verbal Abstract Intelligence	
Reports of Amount of Schooling	
Reports of School Progress	
Reports of Illiteracy	
Results of Army Mental Tests	Results of Tests of Non-Verbal Concrete Intelligence
Results of Tests of Mechanical Intelligence	

An analysis of the sixty-three individual comparisons of correlational results possible for the types of evidence represented by non-delinquent groups<sup>25</sup> results in the order of magnitude from

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Mental Tests, twice; higher than Results of Tests of Non-Verbal Concrete Intelligence, once; and higher than Results of Tests of Mechanical Intelligence, once.

Reports of Educational Achievement are classified higher than Results of Tests of Verbal Abstract Intelligence, once.

Results of Tests of Verbal Abstract Intelligence are classified higher than Results of Army Mental Tests, twice; higher than Results of Tests of Non-Verbal Concrete Intelligence, three times; and higher than Results of Tests of Mechanical Intelligence, twice.

Results of Army Mental Tests are classified with Results of Tests of Non-Verbal Concrete Intelligence, once; and higher than Results of Tests of Mechanical Intelligence, once.

Results of Tests of Non-Verbal Concrete Intelligence are classified higher than Results of Tests of Mechanical Intelligence, twice.

<sup>23</sup> Types of evidence on the same horizontal level cannot be differentiated from each other as to order.

<sup>24</sup> Nine of the seventy-three comparisons upon which this order of magnitude is based fail to accord with it. These are indicated in the summary by asterisks.

<sup>25</sup> The outcomes of the individual comparisons for non-delinquent groups are indicated in the following summary:

Ratings as to Abstract Intelligence are classified higher than Ratings as to Social Intelligence, three times, and with this type of evidence, twice\*; higher than Ratings as to Abstract and Social Intelligence, once; higher than Reports of Amount of Schooling, twice; higher than Reports of School Progress, once; higher than Reports of Educational Achievement, three times, with this type of evidence, once,\* and lower than this type of evidence, once\*; higher than Reports of Extra-Curricular Activities, three times; higher than Results of Tests of Verbal Abstract Intelligence, four times; and higher than Results of Tests of Mechanical Intelligence, once.



highest to lowest<sup>26</sup> shown in the following tabulation:<sup>27</sup>

NON-DELINQUENT GROUPS

Ratings as to Abstract Intelligence

Ratings as to Social Intelligence	Ratings as to Abstract and Social Intelligence	Reports of Educational Achievement
Reports of School Progress		Reports of Extra-Curricular Activities

Results of Tests of Verbal Abstract Intelligence

Reports of Amount of Schooling

Results of Tests of Mechanical Intelligence

A study of the orders of magnitude for delinquent and for

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Ratings as to Social Intelligence are classified with Ratings as to Abstract and Social Intelligence, once; higher than Reports of Amount of Schooling, twice; higher than Reports of School Progress, once; higher than Reports of Educational Achievement, once,\* with this type of evidence, twice, and lower than this type of evidence, once\*; higher than Reports of Extra-Curricular Activities, three times; higher than Results of Tests of Verbal Abstract Intelligence, four times; and higher than Results of Tests of Mechanical Intelligence, once.

Ratings as to Abstract and Social Intelligence are classified with Reports of Educational Achievement, once; and higher than Reports of Extra-Curricular Activities, once.

Reports of Amount of Schooling are classified lower than Reports of School Progress, once; lower than Reports of Educational Achievement, twice; lower than Reports of Extra-Curricular Activities, twice; higher than Results of Tests of Verbal Abstract Intelligence, once,\* and lower than this type of evidence, once; and lower than Results of Tests of Mechanical Intelligence, once.\*

Reports of School Progress are classified lower than Reports of Educational Achievement, once; with Reports of Extra-Curricular Activities, once; with Results of Tests of Verbal Abstract Intelligence, once\*; and higher than Results of Tests of Mechanical Intelligence, once.

Reports of Educational Achievement are classified higher than Reports of Extra-Curricular Activities, three times; higher than Results of Tests of Verbal Abstract Intelligence, three times; and higher than Results of Tests of Mechanical Intelligence, once.

Reports of Extra-Curricular Activities are classified higher than Results of Tests of Verbal Abstract Intelligence, once, and with this type of evidence, once\*; and higher than Results of Tests of Mechanical Intelligence, once.

Results of Tests of Verbal Abstract Intelligence are classified higher than Results of Tests of Mechanical Intelligence, once.

<sup>26</sup> Types of evidence on the same horizontal level cannot be differentiated from each other as to order.

<sup>27</sup> Ten of the sixty-three comparisons upon which this order of magnitude is based fail to accord with it. These are indicated in the summary by asterisks.

non-delinquent groups will serve to summarize the present comparison for types of evidence, and at the same time will afford important information regarding the effect of different types of evidence upon the correlational results of the research.

The most important finding of this comparison both for delinquent and for non-delinquent groups is the fact that the most subjective types of evidence, namely, Estimates of Mental Deficiency and Ratings as to Intelligence, including Ratings as to Abstract Intelligence, Ratings as to Social Intelligence, and Ratings as to Abstract and Social Intelligence, show the highest degree of correlation between morality and intellect, whereas the least subjective type of evidence, namely, Results of Intelligence Tests, including Results of Tests of Verbal Abstract Intelligence, Results of Army Mental Tests, Results of Tests of Non-Verbal Concrete Intelligence, and Results of Tests of Mechanical Intelligence, shows the lowest. The only exception to this general statement in both instances is the location of Results of Tests of Verbal Abstract Intelligence above one or more types of Reports of Educational Status. A satisfactory explanation of this exception for delinquent groups, in which instance the irregularity is greater, readily suggests itself, however, when it is recalled that Earlier Results of Tests of Verbal Abstract Intelligence, prominently represented in the case of non-correlational studies of the relation between delinquency and mental inferiority, were only relatively objective in comparison with Estimates of Mental Deficiency, in view of the fact that, although intelligence tests were used as a basis for decision in determining the percentage intellectually deficient in these earlier results, many non-measurable factors also were frequently taken into consideration. It will be recognized that as a result of the marked or partial subjectivity of the data in the case of these two types of evidence, an investigator, however disinterested and competent, was presumably influenced by the tendency to assign a higher percentage of mental or of intellectual deficiency to a suspected group than he or another investigator would be likely to assign to a comparable unsuspected group. This tendency is doubtless due to the fact that an investigator seeking to ascertain the proportion of feeble-mindedness in a group of delinquents would be unconsciously influenced in his decision by the widely prevalent notion that all delinquents are likely to be feeble-minded, unless he used wholly objective

methods; whereas the same or another investigator, seeking to ascertain the proportion of feeble-mindedness in a group of public school children (who are generally supposed to be of normal mentality), and likewise the proportion in the population at large, would be inclined to err in the opposite direction, unless he also used wholly objective methods.

The dangers inherent in a method of diagnosing intelligence which takes into account subjective as well as objective factors and a practical remedy are suggested by Kuhlmann in an article on mental deficiency, feeble-mindedness, and defective delinquency, in these words:

"... By including the social criterion and all that it implies almost a score of things are brought in, the status of which either cannot be determined at all or only very roughly estimated for any given case. . . .

"We cannot get out of this difficulty entirely, but we can compromise and remove most of it. The compromise consists in drawing the line in degrees of mental deficiency below which every case will be defined as feeble-minded, irrespective of any other consideration. . . . There is no other way of escaping the necessity of considering every item the social criterion brings in for every grade of mental deficiency down to the lowest grade of idiocy." (62, pp. 68-69)

Although the explanation given doubtless calls attention to the most potent extraneous factor affecting the magnitude of the correlational results for Results of Tests of Verbal Abstract Intelligence, it is nevertheless important to note that the issue is complicated, since other factors are operative at the same time.<sup>28</sup> Thus

<sup>28</sup> Attention was called to the influence of many factors, including the marked or partial subjectivity of the data, a difference in the racial composition of the paired groups, a difference in the ages of the paired groups, a geographical disparity in the data for the paired groups, an unrepresentative intelligence distribution for one or both of the paired groups, the lock-step system of promotion, the tendency of the more intelligent offender to escape detection as delinquent, and various other factors of lesser importance, in so far as they affect these and other types of evidence represented by non-correlational studies of the relation between delinquency and mental inferiority, in the condensed summaries for the several types of evidence represented in the abridged review of non-correlational studies presented in Chapter IV. The effect of these various factors, however, is more explicitly stated in connection with the interpretation of Table I in Chapter VI, the effect of the type of subject utilized also being considered. For a much more detailed statement the interpretations of the detailed tables of the tabular review of non-correlational studies, as given in a separate mono-

the relatively high position held by this type of evidence may be explained in part by a difference in the racial composition of the paired groups in certain instances in the case of Later Results of Tests of Verbal Abstract Intelligence, a factor which reacts to the advantage of the non-delinquent groups with which comparison was made, and thus leads to an increase in the degree of relationship found. The effect of this factor in this case, on the other hand, is more or less offset by a difference in the ages of the paired groups and a geographical disparity in the data for the paired groups, two factors which are operative in certain instances and which tend in general to decrease the degree of relationship found; and an unrepresentative intelligence distribution for the paired groups, a factor which tends to decrease the degree of relationship or even to change the type of relation found by the studies concerned.

In view of the finding that Ratings as to Intelligence for non-delinquent groups occupy the highest place, corresponding to Estimates of Mental Deficiency for delinquent groups, in the hierarchy of correlational results, it is of particular interest to note that the tendency to assign a higher percentage of mental inferiority to a suspected group, applied in the preceding discussion to delinquent groups, is simply a modified form of the halo error, pointed out within recent years by Thorndike as characteristic of studies in which ratings by associates constitute the measure of various personality traits, and apparently the most influential extraneous

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graph, should be consulted (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chaps. 2, 3, 4, and 5).

Other factors of lesser importance affecting the correlational results for delinquent groups, and in addition the effect of the type of comparative data utilized (which is more or less dependent upon the subjectivity of the data), are discussed in connection with the interpretations of Tables II-VI in Chapter VI.

In comment upon the factors specifically mentioned in the text it should be stated that, although the factors suggested here and elsewhere in the discussion as affecting the degree of relationship found in the case of delinquent groups were influential mainly to the extent that results derived from the non-correlational studies were effective in determining the order of magnitude for the different types of evidence, as a matter of fact the other results presented played a minor rôle. Thus by reference to Table XXX it can be ascertained that sixty-four of the seventy-three individual comparisons of correlational results possible for types of evidence are for coefficients of colligation; moreover, by reference to Tables I and II it will be found that 95 of the 106 coefficients of colligation tabulated in the research were obtained by the statistical reduction of the non-correlational studies, as compared with 11 coefficients of this type reported in the literature.

factor affecting the correlational results for non-delinquent groups in the present research.<sup>29</sup> In his article pointing out a constant error in psychological ratings, Thorndike calls attention to the dangers of the rating method and suggests a means of counteracting them in these words:

"The writer has become convinced that even a very capable foreman, employer, teacher, or department head is unable to treat an individual as a compound of separate qualities and to assign a magnitude to each of these in independence of the others. The magnitude of the constant error of the halo, as we have called it, also seems surprisingly large, though we lack objective criteria by which to determine its exact size. As a consequence science seems to demand that, in all work on ratings for qualities the observer should report the evidence, not a rating, and the rating should be given on the evidence to each quality separately without knowledge of the evidence concerning any other quality in the same individual." (191, pp. 28-29)<sup>30</sup>

In considering further the comparison for types of evidence it should be noted that this difference in the findings for objective and subjective types of evidence continues to hold in the case of non-delinquent groups for Ratings as to Social Intelligence, a subjective measure of social intelligence, as compared with Reports of Extra-Curricular Activities, an objective measure of social intelligence. At the same time, however, this difference fails to hold in the case of both delinquent and non-delinquent groups for

<sup>29</sup> More or less detailed analyses of the influence of the halo error under different circumstances or as affecting particular types of evidence are included in the interpretations of Tables VIII and IX in Chapter IX, Table XVII in Chapter XIX, Table XVIII in Chapter XX, and Table XIX in Chapter XXI. Other factors of lesser importance affecting the correlational results for non-delinquent groups are discussed in connection with the detailed interpretations of Tables VII-IX in Chapter IX, Tables XIII-XV in Chapter XIX, and Tables XXIV-XXVI in Chapters XXVI-XXVIII.

<sup>30</sup> In this connection it is of interest to note that in his article on the rating of human character Rugg gives an affirmative answer to the question whether human character can be rated on point scales accurately enough for practical uses in education, only if conditions as rigorous as these are observed:

"First, if each final rating given a person is the average of *three independent* ratings, each one made on a scale as objectified as the man-to-man-comparison type of scale.

"Second, if the scales on which the ratings are made are comparable and equivalent, having been made in conferences under the instruction of one skilled in rating scale work.

"Third, if the three raters are so thoroughly acquainted with the person rated that they are competent to rate." (183, p. 425)

Reports of Educational Achievement as compared with the other less objective types of Reports of Educational Status, although by analogy with Results of Intelligence Tests it should hold the lowest place. If this finding be accepted as genuine, in spite of the scant data upon which it is based in the former case, among the explanations which may account for the comparatively low rating of two of these types of evidence among delinquent groups are a geographical disparity in the data for the paired groups, an unrepresentative intelligence distribution for one of the paired groups, and a difference in the ages of the paired groups in certain instances in the case of Reports of Amount of Schooling, factors which react in the main to the advantage of the delinquent groups as contrasted with the non-delinquent groups with which they were compared, and thus lead to a decrease in the degree of relationship found; and the lock-step system of promotion in the case of Reports of Amount of Schooling and Reports of School Progress, a factor which is especially important in both cases by reason of the fact that the tendency to promote by age rather than ability consistently favors the older, less able pupils, and as a result would again benefit the delinquent groups, with a consequent decrease in the degree of relationship found. At the same time, it should be recognized that the customary failure of investigators to take into account the difference in the ages of the paired groups has quite the opposite effect in the case of Reports of School Progress, in which instance it clearly reacts to the advantage of the non-delinquent groups with which comparison was made; and that other factors similarly tend to increase the degree of relationship found in the case of two other types of evidence under consideration, for example, an unrepresentative intelligence distribution for one of the paired groups in the case of Reports of Illiteracy, and a difference in the racial composition of the paired groups in the case of Reports of Amount of Schooling.

In these circumstances possibly the most satisfactory explanation of the relative order of magnitude of the types of evidence under consideration found in the case of delinquent groups is the fact that the finding of a comparatively high degree of correlation between delinquency and educational backwardness, both in comparison with other types of Reports of Educational Status and also in comparison with Results of Intelligence Tests, may actually be justified by the facts. Thus in his book *The Young Delinquent*

Burt summarizes some of his own findings with reference to this point as follows:

"... the majority of criminal children, though not to be branded as defective or subnormal, are nevertheless indubitably backward." (16, p. 322)

With reference to the average juvenile delinquent, Burt says further:

"At every stage he is far more behind in knowledge than in capacity, and tends all through his school career to be a year or more beneath even the low standard of scholastic work to which, with his intelligence, he should at least attain." (16, p. 322)

In the present consideration a further point is of unusual significance, the fact that Results of Tests of Mechanical Intelligence show the lowest degree of correlation between morality and intellect for both delinquent and non-delinquent groups. Reference to the classification of coefficients given in Table XXX, supplemented by the analysis of the individual coefficients tabulated in the three parts of the research in Appendix IV, discloses that, taking the results as a whole (unless Results of Tests of Non-Verbal Concrete Intelligence also be included), the relation found is essentially indifferent rather than direct only for this type of evidence. Confidence in this divergent finding appears to be justified, however, by reason of an even more divergent finding reported by Terman in the volume entitled *Mental and Physical Traits of a Thousand Gifted Children* for nearly six hundred gifted children and more than five hundred unselected children composing a control group. The method of study and the result in question are briefly summarized in the following quotation:

"... Each child was rated, by the graphic rating scale method, on twenty-five traits, falling roughly into seven groups: intellectual, volitional, emotional, moral, social, physical, and special ability traits. . . .

"... Mechanical ingenuity is the only trait on which the control group is rated higher than the gifted group." (189, pp. 554-55)

It is noteworthy that neither the divergent finding of the present research nor the confirmatory finding by Terman can be construed as indicating, on the one hand, that delinquents actually equal non-delinquents, or, on the other hand, that unselected children actually excel gifted children, in innate mechanical ability.

At least two factors which help to explain the results in question are operative: the time element and the environmental element. Thus the comparatively wide variety of intellectual interests which tends to characterize the non-delinquent or the gifted child leaves less time for the development of mechanical interests. Furthermore, intellectual interests on the part of a child point to intellectual interests on the part of his parents, which result in an abundance of verbal stimuli in the environment, presumably accompanied by diminution in the number of mechanical stimuli. Regardless of a satisfactory alibi for non-delinquents or for gifted children, however, the fact remains that the finding of a practically zero correlation between delinquency and mechanical intelligence is a matter of the greatest importance from the standpoint of the need for curriculum revision as a means of delinquency prevention.<sup>31</sup>

The genuineness of this finding for Results of Tests of Mechanical Intelligence is further attested by the relatively low finding for Results of Tests of Non-Verbal Concrete Intelligence and Results of Army Mental Tests. In the two types of results first mentioned ability to deal with things and mechanisms rather than with symbols is important, and in the third type this ability is likewise important to the limited extent that Army Beta rather than Army Alpha served as the test of intelligence employed. It should be noted in passing, however, that the comparatively low rating of Results of Army Mental Tests is not influenced merely by the partial use of Army Beta, but also by the failure on the part of certain investigators to take into account a difference in the racial composition of the paired groups, a notable shortcoming of the studies under consideration,<sup>32</sup> combined with an unrepresentative

<sup>31</sup> This point is further amplified and suggested changes in the curriculum at the lower levels providing for the manually-minded child are outlined in a forthcoming book by the author (cf. *Salvaging the Potential Delinquent in Our Schools: Delinquency Prevention through Curricular Activities Adapted to the Manually-Minded Child*, by Clara Chassell Cooper).

<sup>32</sup> The failure on the part of investigators to take sufficiently into account a difference in the racial composition of the paired groups doubtless goes far to explain the violent reaction which has set in within recent years against the idea that delinquency and mental deficiency are positively correlated. It will be observed that the contention to the contrary is generally supported by evidence based on test results for adult offenders, obtained by the use of Army mental tests by investigators who utilize as comparative data the test results for the Army draft for the different states taken from the volume published under the auspices of the National Academy of Sciences, entitled



sentative intelligence distribution for one of the paired groups and a geographical disparity in the data for the paired groups to be noted in certain instances, in addition to the almost exclusive representation of this type of evidence by adult offenders,<sup>33</sup> all factors which tend to decrease the degree of relationship found, and which are but little offset by the recurring difficulty of a difference in the ages of the paired groups, of slight consequence in this case.

In final comment upon the order of magnitude of the various types of evidence it should be noted that, although no individual comparisons for Reports concerning Delinquency could be made because this type of evidence alone was represented by feeble-minded groups, the gross comparison of types of evidence possible by reference to Table XXX, supplemented by the analysis of individual coefficients in Appendix IV, shows that Reports concerning Delinquency do not rank below any other type of evidence with the possible exception of Estimates of Mental Deficiency in the degree of correlation between morality and intellect which they reveal. This is a significant finding in view of the fact that measures of delinquency for feeble-minded groups constitute an important check upon measures of mental inferiority for delinquent groups as to the relation between delinquency and mental inferiority. At the same time, the comparatively high degree of relationship found in this instance needs to be discounted by reason of the tendency of the more intelligent offender to escape detection as delinquent, a difference in the ages of the paired groups, again to be noted in certain instances, and the exclusive use of the coefficient of colligation as the means of determining the degree of relationship,<sup>34</sup> all factors which unduly influence the magnitude of the correlational results.

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*Psychological Examining in the United States Army*, without regard to the fact that the results for the white draft as reported by states include foreign-born cases (cf. 79, p. 681). An important illustration of studies of this type is the investigation reported by Murchison in his book *Criminal Intelligence* (78). This point is further discussed in the separate monograph presenting the tabular review of non-correlational studies of the relation between delinquency and mental inferiority (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chap. 5).

<sup>33</sup> The influence of the maturity of the delinquent groups upon the correlational results is considered in the succeeding comparison of the correlational results for the different types of groups with identical types of evidence, countries, and types of coefficients.

<sup>34</sup> The influence of the coefficient of colligation upon the correlational re-

In summary, then, it may be said that the comparison of the correlational results for the different types of evidence with identical types of groups, countries, and types of coefficients leads on the one hand to a conservative conclusion as to the relation between morality and intellect, and on the other hand to a recognition of actual differences in the degree of relationship for various types of evidence.

*A Comparison of the Correlational Results for the Different  
Types of Groups with Identical Types of Evidence,  
Countries, and Types of Coefficients*

The present comparison is based on the individual comparisons of correlational results for all possible types of groups with identical types of evidence, countries, and types of coefficients.<sup>35</sup>

An analysis of the seven individual comparisons of correlational results possible for the types of groups representing feeble-minded groups<sup>36</sup> results in the order of magnitude from highest to lowest<sup>37</sup>

sults is considered in a later comparison of the correlational results for the different types of coefficients with identical types of evidence, types of groups, and countries.

<sup>35</sup> These individual comparisons of correlational results are possible by reference to the graphic interpretation of the correlational results of the research given in Table XXX. Summaries of the outcomes of the individual comparisons possible for the types of groups representing feeble-minded, delinquent, and non-delinquent groups from which the orders of magnitude of the correlational results presented in the text were derived are given in footnotes accompanying the orders of magnitude in question. In explanation of these summaries it should be stated that, although the number of individual comparisons analyzed for the different types of groups varies considerably, every comparison permitted by the data available has been utilized. All comparisons are made, as usual, on a scale from +1.00 to -1.00.

It will be noted that in the case of non-delinquent groups no comparisons were possible for Royalty.

<sup>36</sup> The outcomes of the individual comparisons for feeble-minded groups are indicated in the following summary:

General Feeble-Minded Population is classified higher than Feeble-Minded Persons at Large in Community, once; higher than Feeble-Minded Persons in Institutions, once, and with this type of group, once\*; and higher than Feeble-Minded Children in Public Schools, once.

Feeble-Minded Persons at Large in Community are classified lower than Feeble-Minded Persons in Institutions, once; and with Feeble-Minded Children in Public Schools, once.

Feeble-Minded Persons in Institutions are classified higher than Feeble-Minded Children in Public Schools, once.

<sup>37</sup> Types of groups on the same horizontal level cannot be differentiated from each other as to order.

shown in the following tabulation:<sup>38</sup>

FEEBLE-MINDED GROUPS	
General Feeble-Minded Population	
Feeble-Minded Persons in Institutions	
Feeble-Minded Persons at Large in Community	Feeble-Minded Children in Pub- lic Schools

An analysis of the twenty-eight individual comparisons of correlational results possible for the types of groups representing delinquent groups<sup>39</sup> results in the order of magnitude from highest to lowest shown in the following tabulation:<sup>40</sup>

DELINQUENT GROUPS
Alcoholics
Sex Offenders
Juvenile Delinquents
Adult Criminals

An analysis of the nineteen individual comparisons of correlational results possible for the types of groups representing non-delinquent groups<sup>41</sup> results in the order of magnitude from highest

<sup>38</sup> One of the seven comparisons upon which this order of magnitude is based fails to accord with it. This is indicated in the summary by an asterisk. In spite of this essential agreement, it is evident that without additional data the order given above must be regarded as highly tentative.

<sup>39</sup> The outcomes of the individual comparisons for delinquent groups are indicated in the following summary:

Adult Criminals are classified lower than Juvenile Delinquents, six times, and higher than this type of group, three times\*; lower than Sex Offenders, six times, and higher than this type of group, twice\*; and higher than Alcoholics, once.\*

Juvenile Delinquents are classified lower than Sex Offenders, four times, with this type of group, once,\* and higher than this type of group, twice\*; and lower than Alcoholics, twice.

Sex Offenders are classified lower than Alcoholics, once.

<sup>40</sup> Nine of the twenty-eight comparisons upon which this order of magnitude is based fail to accord with it. These are indicated in the summary by asterisks.

<sup>41</sup> The outcomes of the individual comparisons for non-delinquent groups are indicated in the following summary:

College Graduates are classified lower than College Students, twice; lower than School Children, twice; and lower than Aviation Cadets, once.

College Students are classified lower than School Children, four times, with this type of group, twice,\* and higher than this type of group, three times\*; lower than Aviation Cadets, once; and with Boy Scouts, once.

School Children are classified lower than General Population, once; higher than Aviation Cadets, once; and higher than Boy Scouts, once.

to lowest<sup>42</sup> shown in the following tabulation:<sup>43</sup>

NON-DELINQUENT GROUPS		
	General Population	
	School Children	
	Aviation Cadets	
College Students		Boy Scouts
	College Graduates	

A study of the orders of magnitude for feeble-minded, for delinquent, and for non-delinquent groups will serve to summarize the present comparison for types of groups, and at the same time will afford important information regarding the effect of different types of groups upon the correlational results of the research.

In the first place, an important finding of this comparison for both feeble-minded and non-delinquent groups, in spite of the small amount of data upon which it is based, is the fact that unrestricted (or relatively unrestricted) groups show a higher degree of correlation between morality and intellect than do restricted groups, since General Feeble-Minded Population in the one case and General Population in the other case occupy the highest positions in their respective hierarchies of types of groups.<sup>44</sup> Obviously, a contrary result is scarcely to be expected, in view of the well-known effect of restriction in range upon the size of a coefficient. The necessity for taking this fact into consideration is pointed out by Otis and Knollin in an article discussing the reliability of the Binet scale and of pedagogical scales, as follows:

“ . . . differences in the heterogeneity of the group make very great differences in the values of the coefficients of correlation between the scores. . . . ” (172, p. 129)

<sup>42</sup> Types of groups on the same horizontal level cannot be differentiated from each other as to order.

<sup>43</sup> Five of the nineteen comparisons upon which this order of magnitude is based fail to accord with it. These are indicated in the summary by asterisks.

<sup>44</sup> It should be noted that, although this finding in the case of non-delinquent groups is based upon a single individual comparison, the fact that it is supported by the absolute value of the result for General Population, which is high enough to place it in the highest classification represented by non-delinquent groups, as reference to Table XXX shows, is an added indication of its validity.

Rugg similarly comments on the influence of restriction in range and reports the classic experiment which shows how great the effect of this factor may actually be under certain conditions, in the following quotation taken from his chapter on statistical methods applied to educational testing in *The Twenty-First Yearbook* of the National Society for the Study of Education:

"... *the size of the coefficient depends upon the spread of the group tested.* The spread of ability in a single school grade is probably not more than one third what it is in 12 grades. This difference in dispersion will change markedly the size of the coefficient. For example, Otis gave the Stanford-Binet test to 180 adult males. He divided the test questions into two halves (or forms) so that the first form contained the first half of the questions for each age-level, and the second form contained the second half. The correlation *for the entire group* was .85. Taking only those individuals whose mental ages fell between 13 and 16:11, the correlation proved to be only .44. Taking only those individuals whose mental ages fell between 13 and 14:11,  $r$  was  $-.14$ . Taking now only those between ages 13 and 13:11, the correlation was  $-.62$ ." (169, p. 78)

In an article on the reliability of test scores, Kelley likewise calls attention to the importance of the effect of restriction in range in the passage reproduced below:

"To secure a reliability coefficient of 0.40 from a group composed of children in a single grade is probably indicative of greater, not less, reliability than to secure a reliability coefficient of 0.90 from a group composed of children from the second to twelfth grades. If it is reasonable to assume that in terms of true ability the spread of talent is four times as great in the eleven grades as in a single grade, the correlation in the second case would need to be 0.914 in order to indicate as close a relationship as that shown by a reliability coefficient of 0.40 in the single grade." (155, p. 374)

Further emphasizing the importance of this factor, in an article describing a method for correcting coefficients of correlation for heterogeneity in the data, May formulates a useful general rule for analyzing the effect of heterogeneity in these words:

"In general, we may say that heterogeneity *tends* to increase correlation when its effects on the two variables are similar; it *tends* to decrease correlation when its effects on the two variables are dissimilar, or when it materially affects one and not the other." (159, p. 419)

In the second place, an important finding for delinquent groups only is the fact that the more specialized types of offenders represented, namely, Sex Offenders and Alcoholics, apparently show a higher degree of correlation between morality and intellect than do the more general types, as Adult Criminals and Juvenile Delinquents.<sup>45</sup> This finding is in harmony with widespread belief on the subject, as quotations from a number of authorities tend to indicate. Thus Miner, summarizing the findings of various investigations as to the frequency of tested deficiency among women and girl delinquents in county and city institutions in his monograph *Deficiency and Delinquency*, makes the following statements with reference to Sex Offenders:

"The most striking conclusion that comes out of the study of this evidence of frequent deficiency among delinquent girls and women is the close association between sex offenses and deficiency. . . .

"The greater amount of deficiency found among female delinquents than among corresponding groups of males is . . . easily accounted for by frequent association between deficiency and sex delinquency on the part of girls and women. The combination of legal sex delinquency and deficiency is due both to a native sex difference and a difference in social attitude toward the two sexes as to this form of offense. Whichever may be the main cause of

<sup>45</sup> This finding is stated tentatively in view of the fact that the summary of the outcomes of the individual comparisons of correlational results upon which it is based discloses that Adult Criminals showed a higher correlation between morality and intellect than Alcoholics in the sole instance in which these two types of groups were directly compared. Notwithstanding, the finding is believed genuine for the following reasons: (1) this particular comparison is inconsistent with the major trend of the individual comparisons, as the asterisk following it in the summary of outcomes referred to indicates; and (2) an analysis of the data concerned, based upon a consideration of the individual groups representing Adult Criminals and Alcoholics which participated in this instance of comparison, disclosed that the inadequacy of the comparative data combined with a difference in the year represented by the percentages for the two groups might be a sufficient explanation of the inconsistent result. It should be explained that the procedure followed in this analysis consisted in the identification of the data involved in this particular comparison by reference to Table XXX, and the subsequent consultation of the appropriate detailed table in the tabular review of non-correlational studies of the relation between delinquency and mental inferiority presented in a separate volume. The detailed table consulted in this instance was the following:

Table 5. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Illiteracy

(cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chap. 4).

the facts found, it is clear that deficiency is, today, most serious among female offenders." (73, pp. 140-41)

Similarly, in his book *The Education of Handicapped Children* Wallin comments as follows:

"... it is probably true that female sex offenders of the professional class yield a larger percentage of mental defectives than any other criminal class. . . ." (117, p. 300)

At the same time, in spite of his conservative view as to the prevalence of feeble-mindedness among delinquents in general, Wallin makes this emphatic assertion with reference to Alcoholics:

"There is no one who doubts the connection between inebriety and mental deficiency." (117, p. 291)

By way of further illustration, an even stronger assertion made by Healy in his textbook *The Individual Delinquent* may be quoted:

"It is now everywhere acknowledged that a considerable share of our worst toppers are defectives. . . ." (49, p. 462)

In the third place, an important finding both for delinquent and for non-delinquent groups is the fact that younger groups, as Juvenile Delinquents and School Children, apparently show a higher degree of correlation between morality and intellect than do older groups, as Adult Criminals and College Students.<sup>46</sup> This tendency in the case of delinquent groups has been noted by other investigators, and has particular significance in view of the extremely low position held by Results of Army Mental Tests, represented almost solely by adult groups, in the preceding comparison for types of evidence. In an article on criminal psychology Doll shows that a difference in the degree of relationship for the two ages may be expected, in the passage quoted below:

<sup>46</sup> This finding is stated tentatively in view of the fact that the summary of the outcomes of the individual comparisons of correlational results upon which it is based discloses that, although College Students are classified lower than School Children four times, these instances of positive comparison are challenged by two instances of neutral comparison and three instances of negative comparison. Notwithstanding, the finding is believed genuine in view of the fact that an identification of the data involved in these comparisons by reference to Table XXX reveals that, although all instances of positive comparison were supported by significant data, only one instance each of neutral and of negative comparison was represented by data of similar importance.

"... Goddard, Terman, Williams and many others have well established the thesis that a large amount of juvenile delinquency is the result of the defective judgment and feeble inhibition, which are characteristic of mental defectives.

"An unwarranted implication from these studies has been that what is true of juvenile delinquency is also true for adult criminals. This implication is distinctly not justified. On the contrary, the psychological problems involved in the study of the adult criminal are fundamentally different from those which are concerned in juvenile delinquency." (29, pp. 21-22)

Slawson finds the explanation of the tendency under consideration somewhat complicated, as indicated by the following passage in his book *The Delinquent Boy*:

"It has been found . . . by several investigators, that among the adult prison population there is a smaller proportion of deficient than among the juvenile delinquent population, due to various factors of selection . . . ; for instance, the greater death rate of deficient. Besides, this smaller proportion of deficient among the adult prison population as compared with the juvenile delinquent population might be due to the fact that with deficient adults a more ample opportunity has been afforded authorities to detect and segregate them, by placing them in institutions for the mentally deficient, than with deficient juveniles, whose youth has as yet prevented their proper segregation. . . ." (97, p. 166)

The explanation of the tendency in the case of non-delinquent groups presumably lies in the greater restriction in range which characterizes the more advanced scholastic groups. It is noteworthy that this principle is further exemplified in the results by the fact that the most highly restricted group in the school category, namely, College Graduates, holds the lowest place in the hierarchy of correlational results.

A consideration of the relative positions of the remaining feeble-minded or non-delinquent groups lacks significance because of the meager data available upon which to make the assignment.

In summary, then, it may be said that the comparison of the correlational results for the different types of groups with identical types of evidence, countries, and types of coefficients points, on the one hand, to the inevitable effect of restriction in range upon the degree of relationship found between morality and intellect, and, on the other hand, to actual differences in the degree of relationship which exists among diverse groups.



*A Comparison of the Correlational Results for the Different Countries with Identical Types of Evidence, Types of Groups, and Types of Coefficients*

The present comparison is based on the individual comparisons of correlational results for all possible countries with identical types of evidence, types of groups, and types of coefficients.<sup>47</sup>

An analysis of the forty-one individual comparisons of correlational results possible for the countries represented by feeble-minded and delinquent groups<sup>48</sup> results in the order of magnitude from highest to lowest<sup>49</sup> shown in the following tabulation:<sup>50</sup>

<sup>47</sup> These individual comparisons of correlational results are possible by reference to the graphic interpretation of the correlational results of the research given in Table XXX. Summaries of the outcomes of the individual comparisons possible for the countries represented by feeble-minded and delinquent and by non-delinquent groups from which the orders of magnitude of the correlational results presented in the text were derived are given in footnotes accompanying the orders of magnitude in question. In explanation of these summaries it should be stated that, although the number of individual comparisons analyzed for the different countries varies considerably, every comparison permitted by the data available has been utilized. All comparisons are made, as usual, on a scale from +1.00 to -1.00.

It will be noted that in the case of non-delinquent groups no comparisons were possible for Europe.

<sup>48</sup> The outcomes of the individual comparisons for feeble-minded and delinquent groups are indicated in the following summary:

United States is classified higher than Great Britain, five times, with this country, twice,\* and lower than this country, once\*; higher than Germany, four times, and with this country, once\*; higher than No Specific Country, United States and Canada, and Canada, once each; with Porto Rico, Philippine Islands, France, and Sweden, once each\*; with Great Britain and Ireland, once; and lower than Belgium, Central Europe, and Australia, once each.

Great Britain is classified higher than Germany, once, and with this country, once\*; higher than No Specific Country, United States and Canada, Philippine Islands, and France, once each; with Porto Rico and Sweden, once each; and lower than Canada, Central Europe, and Australia, once each.

Germany is classified lower than Porto Rico and Great Britain and Ireland, once each.

United States and Canada is classified lower than Philippine Islands and France, once each.

Philippine Islands is classified with France, once.

Sweden is classified lower than Central Europe, once.

<sup>49</sup> Countries on the same horizontal level cannot be differentiated from each other as to order.

<sup>50</sup> Nine of the forty-one comparisons upon which this order of magnitude is based fail to accord with it. These are indicated in the summary by

## FEEBLE-MINDED AND DELINQUENT GROUPS

Belgium	Central Europe	Australia
United States	Canada	Great Britain and Ireland
Porto Rico	Great Britain	Sweden
No Specific Country	Philippine Islands	France
	United States and Canada	Germany

An analysis of the eight individual comparisons of correlational results possible for the countries represented by non-delinquent groups<sup>51</sup> results in the order of magnitude from highest to lowest shown in the following tabulation:<sup>52</sup>

## NON-DELINQUENT GROUPS

United States  
Great Britain

A study of the orders of magnitude for feeble-minded and delinquent and for non-delinquent groups will serve to summarize the present comparison for countries, and at the same time will afford important information regarding the possible effect of different countries upon the correlational results of the research.

Upon superficial examination of the data, the most important finding of this comparison, both for feeble-minded and delinquent and for non-delinquent groups, would appear to be the fact that the United States shows a higher degree of correlation between morality and intellect than does Great Britain. A consideration of the instances of neutral or negative comparison,<sup>53</sup> as well as of

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asterisks. In view of these discrepancies and the large number of countries concerned, it is evident that without additional data the order given must be regarded as highly tentative. The proper order is especially in doubt for Porto Rico, Philippine Islands, France, and Sweden, although the most reasonable level in view of all the comparisons has been chosen.

<sup>51</sup> The outcomes of the individual comparisons for non-delinquent groups are indicated in the following summary:

United States is classified higher than Great Britain, five times, with this country, twice,\* and lower than this country, once.\*

<sup>52</sup> Three of the eight comparisons upon which this order of magnitude is based fail to accord with it. These are indicated in the summary by asterisks.

<sup>53</sup> These instances of neutral or negative comparison can be identified by reference to the appropriate summaries of the outcomes of the individual comparisons of correlational results, in which they are indicated by asterisks since they fail to accord with the orders of magnitude determined upon. In

the instances of positive comparison, however, shows that, whether feeble-minded and delinquent or non-delinquent groups are in question, the fact that the United States is classified higher than Great Britain five times is partially offset by the fact that the two countries are classified together twice and the United States is classified lower than Great Britain once. Furthermore, the finding of a higher degree of correlation between morality and intellect in the United States than in Great Britain being accepted as genuine at the outset, an attempt to explain this outcome by some reasonable hypothesis which would rest upon a firm sociological foundation revealed the necessity of analyzing the data to discover whether or not there was a constant relation between the two countries for particular types of groups. Such an analysis disclosed, in the first place, that in the case of the three types of delinquent groups concerned, namely, Adult Criminals, Juvenile Delinquents, and Sex Offenders, Great Britain was classified higher than the United States or with this country as often as she was classified lower, the instances of positive comparison and the instances of neutral or negative comparison for the different types of groups in the main cancelling each other; and, in the second place, that in the case of the five comparisons for non-delinquent groups representing College Students, Great Britain was classified higher than the United States or with this country oftener than she was classified lower, the instances of positive comparison and the instances of neutral or negative comparison for this type of group, however, almost cancelling each other. Little data remained upon which an explanation could be based, therefore, with the exception of two comparisons for feeble-minded groups, representing General Feeble-Minded Population and Feeble-Minded Persons in Institutions, and three further comparisons for non-delinquent groups, representing School Children. A further pursuit of the analysis back to the individual groups representing the United States and Great Britain which participated in these instances of comparison<sup>54</sup> showed that the inadequacy of the comparative data in

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the present type of analysis all instances of positive, neutral, or negative comparison are traced back to the particular types of groups represented, by consulting the corresponding data in Table XXX.

<sup>54</sup> Information regarding the individual groups upon which this further step in the analysis for the United States and Great Britain is based was located in the detailed tables of the appropriate tabular reviews, whether presented in this volume or in a separate monograph. The detailed table

the case of the feeble-minded groups, and the operation of various selective factors upon a number of the individual groups involved in the case of both feeble-minded and non-delinquent groups, might easily be more potent in determining the degree of relationship found than any difference between the two countries compared. In these circumstances the inference which appears most reasonable is that the difference observed between the correlational results for the United States and Great Britain is not sufficiently established to be regarded as significant, and may easily be due to chance. At the same time, it is interesting to note that the greater homogeneity of the British population with its attendant restriction in range, presumably affecting all types of subjects and accentuated in the case of non-delinquent groups by the more exacting type of selection characteristic of British schools, suggests that an actual difference in the degree of relationship between morality and intellect in the United States and Great Britain similar to that found in the research is at least a reasonable hypothesis, although it is not subject to verification by the data available for the present comparison. Furthermore, it is to be expected that the better methods of apprehending criminals in Great Britain, doubtless diminishing the constant error arising from the tendency of the more intelligent offender to escape detection, other things being equal, would also result in the finding of a lower degree of relationship between the qualities investigated in that country than in the United States; while at the same time the wider use of intelligence tests in the United States, presumably reducing the variable errors due to inadequate methods of classifying in intelligence, should have a similar effect.

A further important finding of this comparison for delinquent groups would appear to be the fact that the United States likewise shows a higher degree of correlation between morality and intellect than does Germany, and, in keeping with this outcome, the fact that Germany on the basis of the scant information available is

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consulted in the case of the feeble-minded groups under consideration was as follows:

Table 1. A Comparison between Paired Feeble-Minded and Non-Feeble-Minded Groups as to Delinquency

(cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chap. 2). The detailed tables consulted in the case of the non-delinquent groups under consideration were Table IX in Chapter IX and Table XXIII in Chapter XXIV of this volume.

entitled to a place only a little lower than Great Britain in the hierarchy of correlational results. Although the discordant data in this case were confined to a single instance of neutral comparison,<sup>55</sup> since the United States was classified higher than Germany four times and with Germany but once, with no instances of negative comparison, the results of the analysis of data for the United States and Great Britain suggested the wisdom of a similar analysis in this case. Such an analysis disclosed that if the single instance of neutral comparison, which chanced to be for Juvenile Delinquents, were cancelled by an analogous instance of positive comparison, likewise for Juvenile Delinquents, the only data upon which to base a conclusion as to the relative standing of the two countries were single comparisons for three different types of delinquent groups, namely, Adult Criminals, Sex Offenders, and Juvenile Delinquents. Moreover, a further pursuit of the analysis back to the individual groups representing the United States and Germany which participated in these instances of comparison<sup>56</sup> again showed that extraneous and selective factors might easily be more potent in determining the degree of relationship found than any difference between the two countries compared. In these circumstances, even if the finding of a higher degree of correlation between morality and intellect in the United States than in Germany be accepted as genuine, an attempt to explain this outcome by some hypothesis of a sociological character would appear hazardous. It is nevertheless of interest that the more homo-

<sup>55</sup> This instance of neutral comparison can be identified by reference to the appropriate summary of the outcomes of the individual comparisons of correlational results, in which it is indicated by an asterisk since it fails to accord with the order of magnitude determined upon. The procedure followed in making the present type of analysis was explained in a preceding footnote.

It should also be noted that in the comparison for Great Britain and Germany there is a similar case of neutral comparison.

<sup>56</sup> Information regarding the individual groups upon which this further step in the analysis for the United States and Germany is based was located in the detailed tables of the appropriate tabular review, presented in a separate monograph. The detailed tables consulted in the case of the delinquent groups under consideration were as follows:

- Table 2. Estimates of Mental Deficiency among Delinquents
- Table 3. Estimates of Mental Deficiency among Non-Delinquents
- Table 5. A Comparison between Paired Delinquent and Non-Delinquent Groups as to Illiteracy

(cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chaps. 3 and 4).

geneous population of Germany in comparison with the United States and the wider use of intelligence tests in the latter case again make the finding a logical one, although the data involved in the present comparison do not permit an analysis of the effect of these factors. Similarly, the data are not adapted to an analysis of the effect of certain differences in the standards of mental deficiency current in the two countries under consideration.

A consideration of the relative positions of the other countries represented lacks significance because of the meager data available upon which to make the assignment.

In summary, then, it may be said that the comparison of the correlational results for the different countries with identical types of evidence, types of groups, and types of coefficients discloses some variation in the results for the different countries, but suggests that extraneous or selective factors acting upon individual groups representing various types of groups included in the comparison may be more effective than the particular country represented in determining the degree of relationship found; while theoretical considerations in their turn point to a real difference in the degree of relationship between morality and intellect under the conditions obtaining in the principal countries compared.

*A Comparison of the Correlational Results for the Different  
Types of Coefficients with Identical Types of Evidence,  
Types of Groups, and Countries*

The present comparison is based on the individual comparisons of correlational results for all possible types of coefficients with identical types of evidence, types of groups, and countries.<sup>57</sup>

<sup>57</sup> These individual comparisons of correlational results are possible by reference to the graphic interpretation of the correlational results of the research given in Table XXX. Summaries of the outcomes of the individual comparisons possible for the types of coefficients represented by delinquent and by non-delinquent groups from which the orders of magnitude of the correlational results presented in the text were derived are given in footnotes accompanying the orders of magnitude in question. In explanation of these summaries it should be stated that, although the number of individual comparisons analyzed for the different types of coefficients varies somewhat, every comparison permitted by the data available has been utilized. All comparisons are made, as usual, on a scale from +1.00 to -1.00.

It may be added that, although no provision is made in the accompanying text for the order of magnitude of the correlational results for feeble-minded groups owing to the fact that but one type of coefficient is represented in

An analysis of the nineteen individual comparisons of correlational results possible for the types of coefficients represented by delinquent groups<sup>58</sup> results in the order of magnitude from highest to lowest shown in the following tabulation:<sup>59</sup>

DELINQUENT GROUPS

Coefficients of colligation  
Rank-difference coefficients of correlation  
Tetrachoric coefficients of correlation  
Correlation ratios  
Product-moment coefficients of correlation

An analysis of the nine individual comparisons of correlational results possible for the types of coefficients represented by non-delinquent groups<sup>60</sup> results in the order of magnitude from highest to lowest shown in the following tabulation:<sup>61</sup>

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this case, abundant opportunity for a study of the relative order of magnitude of the type of coefficient in question is afforded by the data for delinquent groups.

<sup>58</sup> The outcomes of the individual comparisons for delinquent groups are indicated in the following summary:

Coefficients of colligation are classified higher than correlation ratios, twice; higher than tetrachoric coefficients of correlation, once; higher than rank-difference coefficients of correlation, twice; and higher than product-moment coefficients of correlation, six times.

Correlation ratios are classified with tetrachoric coefficients of correlation, once,\* and lower than this type of coefficient, once; and higher than product-moment coefficients of correlation, twice.

Tetrachoric coefficients of correlation are classified lower than rank-difference coefficients of correlation, once; and higher than product-moment coefficients of correlation, once.

Rank-difference coefficients of correlation are classified higher than product-moment coefficients of correlation, twice.

<sup>59</sup> One of the nineteen comparisons upon which this order of magnitude is based fails to accord with it. This is indicated in the summary by an asterisk.

<sup>60</sup> The outcomes of the individual comparisons for non-delinquent groups are indicated in the following summary:

Tetrachoric coefficients of correlation are classified lower than rank-difference coefficients of correlation, once; and with product-moment coefficients of correlation, once.\*

Rank-difference coefficients of correlation are classified lower than product-moment coefficients of correlation, four times, with this type of coefficient, once,\* and higher than this type of coefficient, twice.\*

<sup>61</sup> Four of the nine comparisons upon which this order of magnitude is based fail to accord with it. These are indicated in the summary by asterisks. In view of these discrepancies it is evident that without additional data the order given must be regarded as highly tentative.

## NON-DELINQUENT GROUPS

Product-moment coefficients of correlation

Rank-difference coefficients of correlation

Tetrachoric coefficients of correlation

A study of the orders of magnitude for delinquent and for non-delinquent groups will serve to summarize the present comparison for types of coefficients, and at the same time will afford important information regarding the effect of different types of coefficients upon the correlational results of the research.<sup>62</sup>

<sup>62</sup> An empirical study of the effect of the type of the coefficient upon its magnitude is possible by reference to Tables III, IV, and VI in Chapter VI, respectively presenting correlation ratios and tetrachoric and product-moment coefficients of correlation between measures of delinquency and mental inferiority. Thus a comparison of the results for identical populations and measures obtained by Goring for Adult Criminals, Great Britain, in the case of Estimates of Mental Deficiency, as given in Tables III and IV, shows  $\eta$  (whether positive or negative) consistently higher than  $r_t$  in the four instances of comparison. Similarly, a comparison of the results for identical populations and measures obtained by Fernald, Hayes, and Dawley for Adult Criminals, United States, in the case of Reports of Amount of Schooling, and for Adult Criminals, United States, and Sex Offenders, United States, in the case of Results of Tests of Verbal Abstract Intelligence, and by Slawson for Juvenile Delinquents, United States, in the case of Results of Tests of Verbal Abstract Intelligence, as given in Tables III and VI, shows  $\eta$  (whether positive or negative—correlation ratios showing a varying relation being counted as of the same sign as the coefficients with which they are compared) consistently higher than  $r$  in the five instances of comparison in the first case and in the two instances of comparison in the second case. It should be noted, however, that if comparisons are made on a scale from +1.00 to -1.00,  $\eta$  is higher than  $r_t$  in only three out of four instances in the comparison for Tables III and IV, and  $\eta$  is higher than  $r$  in only six out of seven instances in the comparison for Tables III and VI.

In this connection it is also interesting to note that Slawson and Burt in the references cited in the accompanying text have studied empirically the question of the relation between several different types of coefficients, Slawson reporting  $Q$ ,  $r_c$ ,  $\omega$ , and  $r_{ps}$  calculated for three association tables, and  $Q$  and  $\omega$  for twelve others (cf. 97, p. 162), and Burt formulating in more or less general terms the relationships found to exist between  $Q$ ,  $\omega$ ,  $r$ , and  $r_t$  (cf. 66, pp. 218, 220). The most pertinent of these findings are cited in the text.

Furthermore, attention should be called to a highly technical but also fundamental discussion on the stability of coefficients of association included in an article on theories of association by Pearson and Heron (85, pp. 256-82), in which these authorities compare the values of  $r_t$  and  $Q$  for several different types of data especially selected by Yule to exhibit the variable character of  $r_t$ , and likewise for a typical table of ordinary statistical practice, the values of  $\omega$  and  $\phi$  also being given for one type of data, and certain comparisons being made with  $r$  and other types of coefficients.



One of the most important findings of this comparison for delinquent groups is the fact that coefficients of colligation are classified higher than all types of coefficients with which they are compared, the data being especially convincing in the case of product-moment coefficients of correlation. This finding appears the more significant in view of the fact that the analysis of the individual comparisons of correlational results upon which it is based shows not a single exception to the general rule, whether correlation ratios, tetrachoric coefficients of correlation, rank-difference coefficients of correlation, or product-moment coefficients of correlation are concerned. It is interesting to observe that certain results obtained by Burt support this finding only in part, whereas other results found by Slawson support it fully in so far as the relative magnitude of the two types of coefficients under consideration which he studied are concerned. In the report to the London County Council entitled *Mental and Scholastic Tests*, Burt summarizes his study of the relation found to obtain between a number of the coefficients in question as follows:

"... instead of dividing the children into two groups, first, according to imputed deficiency or non-deficiency and then according to failure or success in the test of ability, we can mark or rank them individually for imputed ability and tested ability respectively. In the cases thus verified the correlations then obtained in the ordinary way as a rule lie between  $\omega$  and  $r_t$  or  $\text{Sin} \left( \frac{\pi}{2} \omega \right)$ , sometimes below the former, and usually nearer the former than the latter."<sup>63</sup> (66, p. 220)

In his book *The Delinquent Boy*, Slawson, studying the relation between several types of coefficients, two of which are under consideration in the present comparison, found the coefficient of colligation calculated from three association tables to be higher, and in fact considerably higher, in all three instances than the product-sum (product-moment) coefficient of correlation for the same data. The pertinency of this result is the more obvious in view of the fact that the relationships under investigation in the case

<sup>63</sup> It should be noted that the relatively high magnitude of the tetrachoric coefficient of correlation in this case is unimportant from the standpoint of the order of magnitude found for this coefficient in the present comparison, because in this discussion Burt was seeking to establish the fact that under certain conditions illustrated by a part of his data results obtained by the use of  $r_t$  or an approximation to  $r_t$  would be too high (cf. 66, p. 220).

of two of the association tables were, respectively, the association between delinquency and tested intelligence deficiency, and the association between delinquency and tested intelligence deficiency plus borderlinity (cf. 97, pp. 160-62).

From the foregoing discussion it would seem to be a reasonable inference that a low degree of relationship between delinquency and mental inferiority will more commonly be found as a result of the use of the product-moment coefficient of correlation or one or another of the coefficients closely allied to it than as a result of the use of the coefficient of colligation.

In direct contrast to the first finding of this comparison is the further finding for delinquent groups that product-moment coefficients of correlation are classified lower than all types of coefficients with which they are compared. Again the analysis of the individual comparisons of correlational results upon which it is based shows not a single exception to the general rule. The significance of this finding, however, is lessened by a contrary finding for non-delinquent groups, which nevertheless is not consistently supported by the individual comparisons of correlational results upon which the latter finding is based.

Since the order of magnitude of the types of coefficients represented by delinquent and non-delinquent groups presumably should be in agreement, in this connection it is interesting to compare the relative orders for the three types of coefficients represented by both types of subjects. The necessary information, given below, shows the product-moment coefficient in the lowest and in the highest place in the two series of results:

DELINQUENT GROUPS:  $\rho$ ,  $r_t$ ,  $r$ .

NON-DELINQUENT GROUPS:  $r$ ,  $\rho$ ,  $r_t$ .

In view of the small number of individual comparisons in the case of both delinquent and non-delinquent groups and the conflicting outcomes of a number of those for non-delinquent groups, the most reasonable inference that can be drawn from the discordant findings given above as to the relative orders of these types of coefficients would appear to be that the deduced order of magnitude for the tetrachoric, the rank-difference, and the product-moment coefficients of correlation is probably due to chance rather than to the rightful claim of any particular type of coefficient for a higher place in the hierarchy of correlational results.

Still another suggestive finding for delinquent groups is the fact that correlation ratios are classified higher than product-moment coefficients of correlation. Although no significance can be attached to this finding because it is based on but two instances of comparison, it interestingly enough accords with the theoretical relationship between the two types of coefficients under certain circumstances,<sup>64</sup> as indicated by the following passage taken from Garrett's *Statistics in Psychology and Education*:

"Since  $\eta$  is a general coefficient it may be employed when the regression is linear as well as non-linear. If the regression is linear . . .  $\eta$  will equal  $r$ ; if the regression is non-linear . . .  $\eta$  will be greater than  $r$ ." (144, p. 205)

In further comment upon the types of coefficients represented in the present comparison, it may be pointed out that all of the coefficients of colligation tabulated in the research were calculated from data for feeble-minded and non-feeble-minded or delinquent and non-delinquent groups, and that part of the tetrachoric coefficients of correlation for delinquent groups were also calculated from data for delinquent and non-delinquent groups. Obviously, the magnitude of the correlational results obtained in these cases is as much dependent upon the non-feeble-minded or the non-delinquent groups selected as upon the feeble-minded or the delinquent groups investigated, while the interpretation of the findings is similarly conditioned.<sup>65</sup> It is therefore quite possible that the relative magnitude of the coefficient of colligation, and in a measure that of the tetrachoric coefficient of correlation, in the case of delinquent groups is attributable to the choice of comparative data to a greater extent than to the nature of the coefficient itself.<sup>66</sup>

<sup>64</sup> And likewise with the actual relationship between these coefficients as found in an empirical study comparing results for identical populations and measures, reported in an earlier footnote.

<sup>65</sup> The necessity of taking these control groups into account in considering the significance of such coefficients has already been noted in the interpretation of Table XXIX in the preceding chapter.

<sup>66</sup> Some support for this hypothesis in the case of coefficients of colligation is to be found in the interpretation of Table I in Chapter VI, in which it was concluded on the basis of a consideration of the probable influence of various factors that the degree of relationship found in the case of certain of the types of evidence represented in the present comparison for types of coefficients was probably too high; and in the case of tetrachoric coefficients of correlation, in the interpretation of Table IV in the chapter indicated, in which it was pointed out in a similar connection that a change in the

In summary, then, it may be said that the comparison of the correlational results for the different types of coefficients with identical types of evidence, types of groups, and countries leads on the one hand to a tendency to attribute a variation in the results obtained by different types of coefficients to chance except in the case of two types (one of which consistently shows a relatively high degree of relationship), in which cases the relative magnitude of the correlational results is apparently due in part to the nature of the comparative data utilized; and on the other hand to a conservative conclusion as to the relation between morality and intellect.

### SECTION 3

#### AN ANALYSIS OF THE EFFECT OF CHANCE INACCURACIES IN THE ORIGINAL MEASURES

The preceding analyses of the effect of different types of subjects, types of evidence, types of groups, countries, and types of coefficients concerned factors which have more or less peculiar application to the present research. The analysis which is now to be undertaken concerns a factor which has much more general application.

The nature and the effect of the factor under consideration are clearly indicated by Thorndike in *An Introduction to the Theory of Mental and Social Measurements*, as follows:

"... There will ... in mental and social measurements commonly be a considerable error in each individual fact of those to be related. ... the influence of chance inaccuracy in the measures to be related *is always to produce zero correlation*. If two series of pairs of values are due entirely to chance the correlation will be zero, and in so far as they are at all due to chance, the correlation will be reduced toward zero.

"The chance variation, which in the long run cuts its own throat in the case of averages, can not, in the case of a correlation, be ... rendered innocuous by mere numbers." (192, pp. 177-78)

Some of the types of errors which may be present in measure-

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comparative data utilized providing for the substitution for data for criminals and the non-criminal community of data for criminals committing different kinds of crime apparently resulted in a lower degree of relationship.

ments of human beings are enumerated by Garrett in the following passage taken from the book already cited:

"The accuracy of any series of test scores or other measures of capacity is always conditioned by the number and size of the chance variations—'errors of observation'—present. The term 'errors of observation' may be taken to include slight changes in technique and procedure on the part of the experimenter, as well as variations in the subjects due to fatigue, distraction, shifts in attention or attitude towards the test, and other minor fluctuations of different sorts." (144, p. 211)

As indicated in the preceding chapter, with negligible exceptions all the coefficients included in the compilation of the correlational results of the research were uncorrected for attenuation. As a result, therefore,—barring the effect of certain constant errors which have already been shown in some instances to operate in a reverse direction from chance variations,—the degree of relationship shown in Table XXX was a minimum, even for the restricted groups commonly represented by the data.

A study of the available uncorrected and the corresponding corrected coefficients bearing upon the problem of the relation between morality and intellect should therefore prove of value in considering the effect of these chance inaccuracies in the original measures in lowering the degree of relationship found, and in formulating a conjecture regarding the degree of relationship which actually exists in the groups represented by these coefficients. Such a study is therefore undertaken in the comparison between uncorrected and corrected coefficients of correlation as to the relation between morality and intellect which follows.

#### *A Comparison between Uncorrected and Corrected Coefficients of Correlation as to the Relation between Morality and Intellect*

The necessary data for the present comparison were derived from the tables presented throughout the research which included both uncorrected and corrected coefficients.<sup>67</sup> Only a part of the

<sup>67</sup> It will be recalled that in the presentation of the coefficients included in the tabular reviews of studies by many investigators in Part I of the research, a column was provided for the tabulation of corrected coefficients if any were reported in the original source, and that in the presentation of the coefficients calculated in the two investigations by the author reported in Parts II and III, corrected coefficients were uniformly reported in conjunc-

figures required for this comparison have been previously presented,<sup>68</sup> and hence a full record of the results involved is desirable. Accordingly, Table XXXI presents a comparison between uncorrected and corrected coefficients of correlation as to the relation between morality and intellect.

This table was constructed from the original coefficients presented in the appropriate tables throughout the volume by the application of the usual quantitative method of weighting employed in the research.<sup>69</sup>

The table summarizes the correlational results for the several authorities reporting both uncorrected and corrected coefficients for the different types of evidence, the different types of groups, and the different countries represented by the studies concerned, the particular information called for in this comparison including the total population, the number and type of coefficients, and the single coefficient or the weighted mean or median, as appropriate, this result being given both for the uncorrected and the corrected coefficients.

The comparison between uncorrected and corrected coefficients of correlation as to the relation between morality and intellect presented in Table XXXI discloses the following facts:

(1) The figures given for the corrected coefficients are consistently

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tion with the corresponding uncorrected coefficients, if the data were sufficiently adequate to warrant it.

As it chanced, in addition to the results reported by the author, both uncorrected and corrected coefficients were reported only in Table IX, which presents product-moment coefficients of correlation between measures of moral character and intelligence. Since the studies reporting the two series of coefficients are all classified as studies of the relation between moral character and intelligence, studies of the relation between delinquency and mental inferiority are not represented in the comparison.

<sup>68</sup> The figures for Parts II and III used in the comparison are included in Tables XXI and XXVII, which respectively present the compilations of the correlational results of studies of the relation between moral and intellectual traits and of studies of the relation between conduct and intelligence. It may be added that a comparison between the uncorrected and the corresponding corrected coefficients of correlation as reported in Table IX is included in the interpretation of the table in question as given in Chapter IX.

<sup>69</sup> Although the method of weighting used in combining the coefficients was quantitative, the number of cases for each coefficient theoretically serving as its frequency in the calculation of the weighted mean or median, as a matter of actual procedure the simple mean of all the uncorrected or corrected coefficients to be combined in a given case was taken, except in the rare instances in which the numbers of cases for the coefficients to be combined in a particular case were unlike.

higher than the corresponding results for the uncorrected coefficients. This finding is of course to be expected from the foregoing discussion and from the very nature of the formulae used in correcting for attenuation.

(2) The change from uncorrected to corrected coefficients apparently tends to have a noticeable or an appreciable effect upon the degree of relationship in the case of the more subjective types of evidence, as compared with an appreciable or a slight effect in the case of the more objective types of evidence,<sup>70</sup> as indicated by the facts given below:

(a) For College Graduates, United States, the degree of relationship tends to be increased from somewhat marked to decidedly marked in the case of Ratings as to Abstract Intelligence, and from fairly low to rather low in the case of Reports of Educational Achievement.

(b) For College Students, United States, the degree of relationship tends to remain very low in the results reported by one investigator and to be increased from rather low to decidedly marked in the results reported by another investigator in the case of Ratings as to Abstract Intelligence; to be increased from fairly low to decidedly marked in the case of Ratings as to Social Intelligence; to be increased from rather low to decidedly marked in the case of Ratings as to Abstract and Social Intelligence; to be increased from somewhat marked to well marked in the case of Reports of Educational Achievement; and to remain rather low in the results reported by one investigator and fairly low in the results reported by another investigator in the case of Reports of Extra-Curricular Activities.

(c) For College Students, Great Britain, the degree of relationship tends to be increased from fairly low to rather low in the case of Ratings as to Abstract Intelligence, and also in the case of Ratings as to Social Intelligence; to be increased from well marked to decidedly marked in the case of Reports of Educational Achievement; and to remain practically negligible in the case of Results of Tests of Verbal Abstract Intelligence.

(d) For School Children, United States, the degree of relationship tends to remain rather low in the case of Results of Tests of Verbal Abstract Intelligence.

(e) For School Children, Great Britain, the degree of rela-

<sup>70</sup> In the case of the results reported by the author it should be noted, however, that the magnitude of the difference between the uncorrected and the corrected coefficients is doubtless due in part to the different methods of correcting for attenuation used in the calculations for College Students and School Children, presumably resulting in relatively higher uncorrected coefficients in the latter case. The particular methods employed are explained in detail in the last section of Chapter XVII and in the second sections of Chapters XXVI-XXVIII.

TABLE XXXI  
A COMPARISON BETWEEN UNCORRECTED AND CORRECTED COEFFICIENTS OF CORRELATION AS TO THE  
RELATION BETWEEN MORALITY AND INTELLECT

NON-DELINQUENT					
AUTHORITY	TYPE OF EVIDENCE	TYPE OF GROUP AND COUNTRY	CORRELATIONAL RESULTS		
			TOTAL POPULATION <sup>a</sup>	NO. AND TYPE OF COEFFICIENTS <sup>b</sup>	SINGLE COEFFICIENT OR WEIGHTED MEAN OR MEDIAN <sup>c</sup>
					UNCORRECTED      CORRECTED
L. M. Chassell Folsom C. F. Chassell Webb Webb	Ratings as to Intelligence Ratings as to Abstract Intelligence	College Graduates United States	197	2 <i>r</i>	.40      .60
		College Students United States	152	2 <i>r</i>	.15      .175
		Great Britain	1,570	43 <i>p</i>	*.32      *
		School Children Great Britain	5,432	28 <i>r</i>	.27      .38
		College Students United States	2,800	20 <i>r</i>	.44      .62
C. F. Chassell Webb	Ratings as to Social Intelligence	College Students United States	1,467	40 <i>p</i>	*.29      *.68
		Great Britain	1,358	7 <i>r</i>	.25      .35
C. F. Chassell	Ratings as to Abstract and Social Intelligence	College Students United States	206	9 <i>p</i>	*.36      *.60



L. M. Chassell	Reports of Educational Status	College Graduates United States	167	2 r	.22	.32
C. F. Chassell	Reports of Educational Achievement	College Students United States	277	10 p	*.43	*.58
Webb		Great Britain	1,358	7 r	.50	.65
Folsom	Reports of Extra-Curricular Activities	College Students United States	76	1 r	.32	.35
C. F. Chassell			213	6 p	*.20	*.25
Webb	Results of Intelligence Tests	College Students Great Britain	686	7 r	.03	.04
C. F. Chassell	Results of Tests of Verbal Abstract Intelligence	School Children United States	1,827	14 r	*.30	*.32
Webb		Great Britain	700	5 r	.11	.17

<sup>a</sup> The number tabulated is the gross number of cases represented by all the coefficients opposite the number in question, regardless of any duplication that may have occurred in the subjects for these coefficients.

<sup>b</sup> The number of coefficients as given in this column applies to both the uncorrected and the corrected coefficients combined, and refers in the case of the former to the number of mean coefficients obtained from the corresponding alternate coefficients calculated from the two halves of the data for one or both measures, or to the number of raw coefficients calculated from the undivided data, according to the data involved.

<sup>c</sup> The method of weighting used for the comparison was quantitative. The number of cases for each coefficient served as its frequency in the calculation of the weighted mean or median, unless, as frequently happened in the calculation of the weighted mean, the number of cases for all the coefficients to be combined was the same, in which instances the simple mean and the weighted mean were identical.

<sup>d</sup> A weighted median is distinguished from a weighted mean by an asterisk.

tionship tends to be increased from somewhat marked to decidedly marked in the case of Ratings as to Abstract Intelligence; and to remain very low in the case of Results of Tests of Verbal Abstract Intelligence.

In summary, then, it may be said that the comparison between uncorrected and corrected coefficients of correlation as to the relation between morality and intellect indicates that, although the degree of relationship which actually exists appears to be at least appreciably greater than the degree of relationship found, a conservative conclusion as to the relation between morality and intellect is nevertheless apparently required, in view of the fact that the more objective types of evidence represented may show only a slight difference in the degree of relationship revealed by the uncorrected and the corrected coefficients.

## CHAPTER XXXIII

### A SUMMARY AND EVALUATION OF THE FINDINGS OF THE RESEARCH AS TO THE RELATION BE- TWEEN MORALITY AND INTELLECT

THE compilation of the correlational results presented in Chapter XXXI afforded a basis for a very general conclusion as to the relation between morality and intellect. Thereafter, the four analyses of the correlational results in terms of types of evidence, types of groups, countries, and types of coefficients included in the graphic interpretation of these results presented in the same chapter, and the comparison of feeble-minded, delinquent, and non-delinquent groups, the four comparisons of the correlational results for the different types of evidence, types of groups, countries, and types of coefficients, and the comparison between uncorrected and corrected coefficients of correlation presented in Chapter XXXII in their turn afforded a means of evaluating and delimiting this preliminary formulation. It still remains to synthesize the conclusion based on the compilation of results for the research as a whole and the several summaries based on the subsequent analyses and comparisons in a more comprehensive and at the same time a more specific conclusion, to check the findings of the research by a recent independent inquiry of primary importance, and to interpret the meaning of the final formulation. Hence a summary and evaluation of the findings of the research as to the relation between morality and intellect is offered in this concluding chapter.

In the summary and evaluation provided in the three sections of this chapter the final conclusion of the research as to the relation between morality and intellect will be formulated, the findings of the Character Education Inquiry as independent evidence of the relation between morality and intellect will be cited, and the significance of the relationship revealed in the research will be considered.

## SECTION I

THE FINAL CONCLUSION OF THE RESEARCH AS TO THE  
RELATION BETWEEN MORALITY AND INTELLECT

The final conclusion of the research as to the relation between morality and intellect may be formulated as follows:

*The relation between morality and intellect in restricted groups is clearly direct. The obtained relation is extremely variable, but tends to be low. It is dependent upon the type of evidence, the type of group, the type of coefficient, and possibly even the country, represented. The true relation is undoubtedly higher than the obtained relation, but apparently at best it tends to be only marked, and frequently it tends to be low. Expressed in correlational terms, the obtained relation may therefore usually be expected to fall between .10 and .39, and the true relation to be under .50.<sup>1</sup>*

It would be desirable, if possible, to rephrase this statement of findings for restricted groups in terms of the population at large. In view of the dearth of data for unrestricted groups, however, the following general statement must suffice:

*Undoubtedly the relation between morality and intellect in the general population is considerably higher than that usually found in restricted groups. Nevertheless, it is hardly probable that this relation is high. Expressed in correlational terms, the relation in the general population may therefore be expected to fall below .70.<sup>2</sup>*

The compendium of evidence upon which this conclusion is based incorporates the findings of nearly three hundred studies pursued by many investigators in this country and abroad,<sup>3</sup> afford-

<sup>1</sup> This conclusion is based on the interpretations of Tables XXIX and XXXI, supplemented by the analyses and the comparisons offered in Chapters XXXI and XXXII, and is translated into correlational terms by means of the key to the classification of coefficients given at the foot of Table XXX.

<sup>2</sup> This conclusion is based on the fact that the mean coefficient of .72 given in the compilation of correlational results for General Population, Great Britain, represents Ratings as to Abstract Intelligence, a type of evidence found to indicate a higher degree of relationship between morality and intellect than the more objective types of evidence for non-delinquent groups, the numerical result in question being interpreted in accordance with the key to the classification of coefficients referred to in the preceding footnote.

<sup>3</sup> The number of studies given includes all the studies represented in the tabular reviews presented in the research, consisting of the studies utilized as primary sources in the tables included in this volume which are listed as

ing diverse types of evidence bearing upon the relation between morality and intellect representing various types of groups and countries, and a mass of correlational results consisting of nearly seven hundred coefficients of different types calculated between measures of morality and intellect for three types of subjects, including more than eleven thousand feeble-minded persons, approximately three hundred thousand delinquents, and nearly twelve thousand non-delinquents.<sup>4</sup> In terms of the principal methods of

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references in the selected bibliography given in Appendix V, Sections 1 and 2; the additional studies cited in these references, or in other references providing comparative data for the non-correlational studies of the relation between delinquency and mental inferiority, which were utilized as secondary sources in these tables or in the tables constituting the tabular review of non-correlational studies as presented in a separate monograph; the studies reported in Appendix I, Sections 1 and 2; and the studies reported in Part II and Part III.

It is of interest to note that, including both the primary and the secondary sources utilized in the tabular review of non-correlational studies, more than two hundred studies, only about half of which are named in the selected bibliography in Appendix V, are incorporated in the research as a result of the statistical reduction of the studies in question (cf. *A Comparative Study of Delinquents and Non-Delinquents*, Chaps. 2, 3, 4, and 5, and Appendix, Section 7).

<sup>4</sup>The figures given are for the experimental groups only, no estimate having been attempted in the case of the control groups utilized in the calculation of coefficients of colligation and tetrachoric coefficients of correlation, whether obtained in the research or reported in the literature.

The actual numbers of cases found for the three types of subjects were as follows:

FEEBLE-MINDED GROUPS (Part I A), 11,052.

DELINQUENT GROUPS (Part I A), 296,281.

NON-DELINQUENT GROUPS (Parts I B, II, and III), 11,828.

These figures were obtained by counting only the subjects for whom the number of cases was specified in the tables included in the several tabular reviews, duplicates in the subjects for whom data were reported by a given investigator having been excluded by taking the largest number of cases for a particular group studied by that investigator for whom data were included in any table, reference to the original detailed tables of the tabular review of non-correlational studies as presented in a separate monograph being made in the case of investigators for whom results are reported in Table I, and proper deductions being made for investigators represented in the tabular review of non-correlational studies who did not contribute crucial percentages that could be utilized in the calculation of the coefficients of colligation obtained by the statistical reduction of the non-correlational studies. The method used resulted in a minimum number of cases, since the largest number of cases for a particular group for whom data were included in any table did not necessarily constitute the total number of cases in the group in question for whom data were included in the various tables. Occasional duplication in some or all of the subjects for whom data were

classification employed throughout the research, the evidence assembled may be analyzed as follows:

#### TYPES OF EVIDENCE

REPORTS CONCERNING DELINQUENCY.

ESTIMATES OF MENTAL DEFICIENCY.

RATINGS AS TO INTELLIGENCE: Ratings as to Abstract Intelligence, Ratings as to Social Intelligence, Ratings as to Abstract and Social Intelligence.

REPORTS OF EDUCATIONAL STATUS: Reports of Illiteracy, Reports of Amount of Schooling, Reports of School Progress, Reports of Educational Achievement.

REPORTS OF EXTRA-CURRICULAR ACTIVITIES.

RESULTS OF INTELLIGENCE TESTS: Results of Tests of Verbal Abstract Intelligence, Results of Army Mental Tests, Results of Tests of Non-Verbal Concrete Intelligence, Results of Tests of Mechanical Intelligence.

#### TYPES OF GROUPS

FEEBLE-MINDED GROUPS: General Feeble-Minded Population, Feeble-Minded Persons at Large in Community, Feeble-Minded Persons in Institutions, Feeble-Minded Children in Public Schools.

DELINQUENT GROUPS: Adult Criminals, Juvenile Delinquents, Sex Offenders, Alcoholics.

NON-DELINQUENT GROUPS: General Population, Royalty, Aviation Cadets, College Graduates, College Students, School Children, Boy Scouts.

#### COUNTRIES

No Specific Country	Great Britain and Ireland
United States and Canada	Great Britain
United States	France
Canada	Belgium

reported by two or more investigators was doubtless more than offset by the omission in the count of the subjects for whom the number of cases was not specified in the tables. Such instances occurred because the number of cases was not always indicated in the original source. As customary throughout the research, any qualifying word or phrase referring to the number of cases was disregarded.

Although the figures cited above are of greater significance, as a matter of record the total numbers of cases for the three types of subjects if duplicates are not excluded and if the numbers of cases arbitrarily supplied are also counted are given below:

FEEBLE-MINDED GROUPS (Part I A), 19,808.

DELINQUENT GROUPS (Part I A), 508,417.

NON-DELINQUENT GROUPS (Parts I B, II, and III), 54,359.

Philippine Islands	Sweden
Porto Rico	Central Europe: Germany, Austria-Hungary, Switzerland
Europe: England, France, Netherlands, Denmark, Sweden, Germany, Austria, Russia, Italy, Spain, Portugal	Germany Australia

#### TYPES OF COEFFICIENTS

Coefficients of Colligation	Rank-Difference Coefficients of Correlation
Correlation Ratios	Product-Moment Coefficients of Correlation
Tetrachoric Coefficients of Correlation	

### SECTION 2

#### THE FINDINGS OF THE CHARACTER EDUCATION INQUIRY AS INDEPENDENT EVIDENCE OF THE RELATION BETWEEN MORALITY AND INTELLECT\*

An important means of testing the validity of the final conclusion of the research as formulated in the preceding section consists in analyzing the findings of the Character Education Inquiry as independent evidence of the relation between morality and intellect, and in summarizing these findings in classificatory terms which conform to those employed elsewhere in this volume.

The results of this outstanding investigation are given in a three-volume report, entitled *Studies in the Nature of Character*, by Hartshorne and May and their collaborators. This report covers a five-year research of the utmost theoretical and practical importance, and in the pursuance of a many-sided inquiry contributes a mass of evidence bearing upon the relation between morality and intellect.

This section accordingly will be devoted to an analysis and a summary of the findings of the Character Education Inquiry.

#### *An Analysis of the Findings of the Character Education Inquiry*

The scope and importance of the inquiry may be judged by

\* The passages in this section taken from the report of the Character Education Inquiry by H. Hartshorne, M. A. May, *et al.*, entitled *Studies in the Nature of Character*, are quoted by permission of The Macmillan Company, publishers.

the fact that more than ten thousand children in public and private schools, representing in all some twenty school populations,<sup>5</sup> were tested by a variety of techniques designed primarily to test such aspects of character as deceit (or honesty), service, self-control, and moral knowledge, opinion, and attitude.<sup>6</sup>

<sup>5</sup> The populations represented by the results which are to be analyzed in this section are indicated below:

(1) The populations represented by the coefficients cited in the quotations taken from *Studies in Deceit*, comprising the first volume of the report of the Character Education Inquiry, included eleven public school populations, designated by the letters A, B, C, E, F, G, H, I, J, L, and M; two institutional groups, also classed with the public school groups, designated by the letters D and K; and three individual private schools and a fourth group of three private schools, designated by the letters P, Q, R, and S (cf. 132, Vol. I, Book One, pp. 105-06). In the part of the investigation concerned with the relation of intelligence to deception, the problem of selection was "handled by combining populations, whenever possible, in such a way as to yield normal distributions of intellects" (cf. 132, Vol. I, Book Two, pp. 134-35).

(2) The populations represented by the coefficients cited in the quotations taken from *Studies in Service and Self-Control* and *Studies in the Organization of Character*, comprising Volumes II and III, respectively, of the report of the Character Education Inquiry, included three public school populations totalling nearly nine hundred children, designated by the letters X, Y, and Z (or XYZ for the combined group), which were studied intensively with the entire battery of tests used in the investigation (cf. 132, Vol. II, p. 7). These three groups were so selected as to provide "a mid-group, Y, a high group, X, and a low group, Z" (cf. 132, Vol. II, p. 7).

<sup>6</sup> The principal tests used in measuring these aspects of character may be described as follows:

(1) For measuring deceit, a battery of deception tests was used, including cheating tests providing twenty-two opportunities to cheat in classroom work, four in athletic contests, two in party games, and one in school work done at home; lying tests consisting of thirty-six questions in one case and ten in the other which might be answered falsely; and stealing tests offering two chances to steal money and one to steal small articles (cf. 132, Vol. I, Book One, pp. 407-08).

(2) For measuring service, a battery of five tests of coöperation and charity was used, which entailed the following desirable responses: sacrificing (two tests); working (two tests); and voting money (one test) (cf. 132, Vol. II, pp. 53, 263-64).

(3) For measuring self-control, two batteries, including five tests of persistence and four tests of inhibition, were used. The battery of persistence tests called for resistance to the following obstacles: difficult reading (one test); difficulty (two tests); and fatigue (two tests). The battery of inhibition tests provided the following types of temptations: to know end of story (one test); to handle puzzles (one test); to handle safe and lock (one test); and to look at pictures, etc. (one test) (cf. 132, Vol. II, pp. 443-44).



In this analysis it will be profitable to consider in order the relation between moral character and abstract intelligence, the relation between volitional character and abstract intelligence, and the relation between moral and volitional character and social intelligence.

### The Relation between Moral Character and Abstract Intelligence

The most significant of the correlational results concerned with the relation between moral character and abstract intelligence are given in the quotations which follow:

(1) The relation of deceit to intelligence, school grade, retardation, and school achievement is indicated in the passages quoted below:<sup>7</sup>

#### INTELLIGENCE

"The correlations between intelligence and the various forms of deception measured are summarized in [the table given on the following page<sup>8</sup>] . . .

"It remains now to arrive at some estimate of the correlation between intelligence and deception as measured by a combination of all techniques. From intercorrelations between these techniques, we can estimate the correlation of an unweighted combination of

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(4) For measuring moral knowledge, opinion, and attitude, four divisions of tests, all but the first being given in two equivalent forms, were used, including the Good Citizenship Test; the Information battery, with five subtests, as follows: cause-effect, recognitions, vocabulary, foresight, and probability; the Opinion A battery, with five subtests, as follows: duties, comprehensions, provocations, principles, and importance; and the Opinion B, or attitude, battery, with nine subtests, covering character preference, attitudes toward school, scaled lying and stealing, success-failure, general attitudes, scaled helpfulness, feelings, scaled cheating, and paired comparisons (cf. 132, Vol. III, pp. 77 and 165).

<sup>7</sup> Since the measures of moral character represented in these passages are tests of deceit rather than tests of honesty, it will be necessary for the reader to interpret all coefficients taken from Volume I of the Inquiry report as positive if negative and as negative if positive, in order to restrict consideration to the relation between moral character and intelligence.

<sup>8</sup> The school populations represented by the various coefficients reported in this table are A, B, C, D, E, L, M, P, Q, R, and S, and the several measures of intelligence employed are CAVI score and National Scale A, Otis Advanced, Multi-mental, and Binet intelligence quotient and mental age (cf. 132, Vol. I, Book Two, pp. 135-43).

Errors of type I, referred to in a footnote accompanying the table, are "those arising from imperfect measures of the abilities tested by the examination on which cheating was permitted" (cf. 132, Vol. I, Book Two, p. 99).

SUMMARY OF CORRELATIONS BETWEEN VARIOUS FORMS OF DECEPTION  
AND INTELLIGENCE [\*]

TEST	1 $r_{\text{II}}$	2 CORRECTED $r$ (I)	3 CORRECTED $r$ (II)	4 $r_{\text{CI,A}}$	5 N
IER school . . . . .	-.350	-.398	-.443	-.493	2644
IER home . . . . .	-.248	-.280	-.587	-.255	2513
Speed . . . . .	-.355	-.410	-.465		1137
Coördination . . . . .	-.345	-.370	-.446	-.445	850
Puzzle . . . . .	-.030	-.040	-.052	-.183	322
Athletic Contests . . . .	-.120	-.140	-.164	-.235	497
Parties . . . . .		-.050		-.100	431
Stealing . . . . .		-.130		-.138	410
Lying . . . . .	-.160	-.268	-.303	-.340	684

\*Column 1 contains the raw  $r$ 's.

Column 2 contains raw  $r$ 's corrected for errors of type I . . .

Column 3 contains  $r$ 's of column 2 corrected for attenuation.

Column 4 contains the partial  $r$ 's between deception and intelligence test scores with age constant.

Column 5 contains the number of cases used.

them with intelligence. . . . Omitting stealing and Parties (partly because adequate intercorrelation data are lacking) and summing the remaining seven . . . , we find that the resulting correlation with intelligence test score or mental age is  $-.54$ . The partial  $r$ , with age constant, is  $-.60$ . This, of course, is only an approximation."<sup>9</sup> (132, Vol. I, Book Two, pp. 143-44)

## SCHOOL GRADE

"... correlation coefficients between grade and cheating for all kinds of deception tested and for all populations . . . average approximately zero, ranging from  $-.360$  to  $+.272$ . The larger  $r$ 's are gathered in [the accompanying table<sup>10</sup>]. . . .

<sup>9</sup>The following footnote referred to at this point is of especial interest: "The multiple R between intelligence and a weighted sum of the deception tests would probably run higher than  $-.60$ ." (132, Vol. I, Book Two, p. 144, fn.)

In this connection it is also of interest to quote the less formal statement of findings given in the first book of the same volume: "If . . . intelligence is regarded as standing for a highly complex social and biological phenomenon, we may summarize the facts for all the various deception tests by stating, as our best estimate of the relation between intelligence and a theoretical combination of *all* our deception tests, a correlation of  $-.50$  to  $-.60$ ." (132, Vol. I, Book One, p. 189)

<sup>10</sup>The school populations represented in the complete table of coefficients summarized above which are not also represented in the abridged table included in the quotation are B, C, L, M, and Q (cf. 132, Vol. I, Book Two, p. 155).

## CORRELATIONS BETWEEN GRADE AND DECEPTION

TEST	A	D	F TO J	K	P	S	R
IER school	-.329			-.263	+.272	+.230	
IER home	-.228		+.243				
Speed	-.338	-.360	+.239				
Puzzle		+.256					+.212
Lying	-.310						

“ . . . with respect to some forms of deception, the school system as a whole does not produce any changes in the tendency to deceive, but . . . on other forms, particularly in the case of the IER school tests, schools such as B, C, P, and Q show a strong tendency for deception to increase above the fifth grade, with the fifth grade appearing more deceptive than the rest in some cases and about the same as the sixth in others.” (132, Vol. I, Book One, pp. 258-60)

## RETARDATION

“Child-guidance clinics frequently report poor grading, that is, acceleration or retardation, as a factor in the promotion of delinquency. Is it also a factor in deceit? . . .

“ . . . if we take one grade at a time . . . , we find that there is a positive correlation between age and deception in two types of test and a zero or sometimes even negative correlation in the other two.” (132, Vol. I, Book One, pp. 262-64)

“ . . . In Book One . . . we reported certain slight positive correlations between retardation and deception. The partial correlation between age and deception with grade constant amounts to the same thing. Such partials are given in [the accompanying table] . . .

PARTIAL CORRELATIONS BETWEEN AGE AND DECEPTION WITH GRADE  
CONSTANT

POPULATIONS:	ABC	PQS	E	F-J	LM	DR	ABC	ADP	PR
IER school . . . . .	.064	-.189							
IER home . . . . .	-.195	-.068							
Speed . . . . .	.413			.037	.375				.327
Coördination . . .			.001	.170	.342				
Puzzles . . . . .						-.040			
Contests . . . . .							.283		
Lying (SA) . . . . .								.282	

“ . . . certain populations and certain techniques show a rather

marked tendency for the older pupils in a given grade to cheat more than the younger ones; in other populations and certain techniques this is not the case." (132, Vol. I, Book Two, p. 154)

## SCHOOL ACHIEVEMENT

"In view of the existence of . . . many rather conflicting factors leading to school achievement, we might anticipate a low correlation between marks and deception, and this is just what we find. . . . Since no relation between school achievement and deception is found, we will confine our report at this point to [the accompanying table<sup>11</sup>] . . .

## CORRELATION OF DECEPTION AND SCHOOL ACHIEVEMENT

	POPULATION		
	A	B	C
Scholastic average and IER school Xi . . . . .	-.200	-.155	
Scholastic average and IER home Xi . . . . .	-.020	+.180	
Non-scholastic average and school Xi . . . . .		-.153	
Non-scholastic average and home Xi . . . . .		+.270	
AQ and school Xi . . . . .			-.030
AQ and home Xi . . . . .			-.090
AQ and CT ratio . . . . .			+.004
EQ and CT ratio . . . . .			-.095

" . . . no matter how measured, whether by teachers' rather subjective ratings or by standardized school tests, the  $r$ 's, though mostly negative, are so low that the slight association observed between

<sup>11</sup> The following explanation of certain symbols and terms used in the table is required:

(1) An Xi score signifies "the individual's deviation from the mean of the honest scores divided by the standard deviation of the honest scores" (cf. 132, Vol. I, Book Two, p. 13).

(2) The non-scholastic average is derived from "the non-scholastic grades, meaning . . . music, drawing, and the manual arts," grades in these subjects being separated from the scholastic grades in the case of one of the two schools in which only teachers' marks were available as evidence of achievement (cf. 132, Vol. I, Book One, p. 270).

(3) The AQ is "the ratio of educational age to mental age," whereas the EQ is "the ratio of educational age to chronological age," the educational age in either case being based on standard school tests (cf. 132, Vol. I, Book One, p. 270).

(4) The CT ratio was based on the classroom cheating tests only, and signifies "the number of times each pupil cheated in proportion to the opportunities offered" (cf. 132, Vol. I, Book Two, pp. 53, 141, 160, fn.).

higher marks and greater honesty might well be accounted for by the fact that those who get the higher marks are usually the more intelligent and, as we have seen, the less deceptive."<sup>12</sup> (132, Vol. I, Book One, pp. 270-71)

(2) The relation of service to intelligence and school achievement is indicated in the passages quoted below:

#### INTELLIGENCE

"The  $r$ 's between intelligence . . . and the total service scores for our three populations and the total are for X, .095; for Y, .193; for Z, .163; and for XYZ, .161. By and large, intelligence has only a barely perceptible relation to the tendencies to be of service which we have measured."<sup>13</sup> (132, Vol. II, p. 139)

#### SCHOOL ACHIEVEMENT

"As our findings show a relationship between both intelligence and proper or accelerated grade-status, it is not surprising to discover that the correlations between teachers' marks and the total service scores are for populations X, Y, and Z, .266, .239, and .346, respectively, with .316 for the total. This indicates that, on the whole, the children who do good class work tend also to engage more fully in helpful acts as occasion arises."<sup>14</sup> (132, Vol. II, p. 143)

(3) The relation of honesty and the integration of honesty to intelligence, school achievement, and retardation is indicated in the passages quoted below:<sup>15</sup>

<sup>12</sup> The following footnote referring to this finding is of especial interest: "That correlations reported between intelligence and school marks are not higher than they are may be due partly to the fact that the marks result in part from deception, whereas the scores on an intelligence test may have no deceptive element in them. Consequently, those whose grades have depended in part on deceit find themselves at a disadvantage when the practice of deception is entirely eliminated, and the two sets of scores, therefore, do not correspond as they theoretically should." (132, Vol. I, Book One, p. 271, fn.)

<sup>13</sup> The measure of intelligence represented by the coefficients cited in this passage is CAVI sigma score (cf. 132, Vol. II, p. 139).

In a footnote accompanying the text quoted, it is stated that these coefficients "and some others are of only slight value, as the regressions involved are frequently nonlinear" (cf. 132, Vol. II, p. 139).

<sup>14</sup> The teachers' marks used as the measure of school achievement for the coefficients cited in this passage "were taken from the school records and cover the period of the testing" (cf. 132, Vol. II, p. 143).

<sup>15</sup> The discrepancy between the mean coefficient of correlation between honesty and intelligence reported in this volume and the result reported in the first volume of the Inquiry report is explained as follows: "It is to be noted that the .50 to .60 correlation is a theoretical determination. . . . The most important factor, however, is the different ranges of scores employed. . . . In the light of these explanations we conclude that the discrepancy between data here reported and data reported in *Studies in Deceit* is more

## INTELLIGENCE

"Low intelligence, inferior home background, and suggestibility were among the most important factors conditioning the tendency toward dishonesty as reported in *Studies in Deceit*. The additional data from our two populations assign a somewhat less important rôle to these three factors. . . .

" . . . In population Y the correlation [between honesty and intelligence] is .308 and in Z .369, the weighted arithmetical average being .344. These correlations have been freed from errors of measurement. In terms of chance factors these are substantial correlations differing from zero by from seven to eleven times their probable errors. Although substantial in the sense of being statistically significant, they are low from a practical standpoint. This is in harmony with all correlations so far reported which are concerned with various aspects of character. But although comparatively low, these correlations indicate that intelligence is one of the most important factors associated with honesty. We have investigated the relations of honesty with twenty-four different variables. Only five of these (integration, honesty ratings, and three moral behaviors) yield higher correlations.

" . . . values [for the correlation between integration and intelligence] are .314, .219, and .266. They are larger than zero by differences from three to five times as large as their probable errors. Of the twenty-four variables investigated, fifteen yield correlations with integration that are higher.

" . . . The correlation between intelligence and honesty, when integration is held constant, is .216. The correlation between intelligence and integration, with honesty constant, is .003. These figures . . . suggest that what correlation we have obtained between intelligence and integration is almost wholly a by-product of the correlation between intelligence and honesty."<sup>26</sup> (132, Vol. III, pp. 335-39)

## SCHOOL ACHIEVEMENT

"The correlations of honesty and integration . . . with scholastic achievement . . . range from .114 to .525. With one exception, these are all statistically significant, the largest value being more than twelve times as large as its probable error. . . .

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superficial than real. From the point of view of relative values, the two sets of data are quite similar since both indicate that intelligence is one of the factors most closely associated with honesty." (132, Vol. III, pp. 336-37)

<sup>26</sup> The measure of intelligence represented by the coefficients cited in this passage is CAVI sigma score (cf. 132, Vol. III, p. 335).

"... in Y the values are low, in Z they are high."<sup>17</sup> (132, Vol. III, pp. 343-44)

#### RETARDATION

"Retardation is a negligible factor in population Y, the correlations with both honesty and integration being .001. In Z, however, it correlates  $-.23$  with honesty and  $-.15$  with integration. That is, the retarded children tend to be significantly more deceptive than the accelerated children in this group." (132, Vol. III, p. 344)

#### The Relation between Volitional Character and Abstract Intelligence

The most significant of the correlational results concerned with the relation between volitional character<sup>18</sup> and abstract intelligence are given in the quotations which follow:<sup>19</sup>

(1) The relation of persistence to intelligence and school achievement is indicated in the passages quoted below:

<sup>17</sup> The measure of school achievement represented by the coefficients cited in this passage is teachers' marks "taken from the actual school records of the children" (cf. 132, Vol. III, p. 342).

<sup>18</sup> The correlational results for studies in self-control, reported in Book Two of Volume II of the Inquiry report, are taken to represent volitional rather than moral character because of the fact that the measures of self-control employed were confined to tests of persistence and inhibition, both traits which would be classified as volitional in conformity with the principles of selection followed in excluding certain measures of character and personality and in classifying ratings as to intelligence, as given in Appendix I, Section 3.

<sup>19</sup> Further evidence of the relation between volitional character and abstract intelligence is afforded by the findings of a number of investigators regarding the correlation between score on the Downey Will-Temperament Tests and score on various intelligence tests, reported by May in his article on the present status of the will-temperament tests in the tabulation reproduced below:

INVESTIGATOR	TEST	SUBJECTS	r
Downey	Binet (Terman)	20 high school students	0.77
Downey	Thorndike	34 high school students	0.47
Downey	Alpha	"A more uniform group"	0.20
Meier	Terman Group	64 high school students	0.60
Bryant	Binet (Terman)	100 delinquent boys	0.38
Bryant	Binet (Terman)	100 delinquent boys	0.48

(cf. 161, p. 48).

The mean of the coefficients tabulated above is .48, and the weighted mean, obtained by the quantitative method of weighting employed throughout the present research with the omission in the number of cases supplied in routine fashion, is .42.

## INTELLIGENCE

"... Using a measure which has the same significance as an IQ, we find a positive correlation between intelligence and persistence. The  $r$ 's for the three populations are: for X, .244; for Y, .226; and for Z, .091. For all combined the coefficient is .147. . . .

"... The partial  $r$ , showing the amount of association between intelligence and persistence among children of the same chronological age, is .366 for X, .306 for Y, and .126 for Z."<sup>20</sup> (132, Vol. II, pp. 371-73)

## SCHOOL ACHIEVEMENT

"The extent of the tendency for more persistent behavior to be associated with higher school grades is shown by the  $r$ 's of .204 for Z, .118 for Y, and actually —.004 for X. It would seem that hard work of the sort represented on the tests is more apt to get results in marks in a population where the general level of intelligence is low (Z) than where the general level is high (X)."<sup>21</sup> (132, Vol. II, p. 375)

(2) The relation of inhibition to intelligence and school achievement is indicated in the passages quoted below:

## INTELLIGENCE

"... Intelligence is not closely associated with our inhibition scores, save in population Z. . . . The  $r$ 's for the total inhibition score are .071 for X, .003 for Y, and .269 for Z. . . .

"Thence we see that intelligence in the sense of ability for one's own age is positively associated with persistence but is only slightly related to inhibition except in population Z."<sup>20</sup> (132, Vol. II, p. 374)

## SCHOOL ACHIEVEMENT

"Resistance to distracting stimuli makes little difference in academic success in X and Y, but is of marked significance in Z. The  $r$ 's are —.033 for X, .112 for Y, and .371 for Z."<sup>21</sup> (132, Vol. II, pp. 375-76)

### The Relation between Moral and Volitional Character and Social Intelligence

The most significant of the correlational results concerned

<sup>20</sup> The measure of intelligence represented by the coefficients cited in these passages is CAVI sigma score (cf. 132, Vol. II, pp. 373-74).

<sup>21</sup> The measure of school achievement represented by the coefficients cited in these passages is teachers' marks (cf. 132, Vol. II, p. 375).



with the relation between moral and volitional character and social intelligence<sup>22</sup> are given in the quotation which follows:

"We come finally to the consideration of the more general relations which may be found to subsist between knowledge and attitude, as measured by a large battery of tests, and conduct, as measured by a variety of techniques. . . .

". . . We shall discuss here only the general results shown in the accompanying table . . .

CORRELATIONS BETWEEN TOTAL MORAL KNOWLEDGE AND TOTAL CONDUCT SCORES

CONDUCT	POPULATION	GC+I*	OPINION A+B*	ALL MK: GC+I+ A+B*	ALL MK, IQ† CONSTANT	COR- RECTED r
Honesty . . . . .	X	.418	.290	.379	.294	.464
	Y	.335	.271	.332	.215	
	Z	.379	.294	.360	.194	
	XYZ	.380	.350	.390	.246	
Coöperation . . . . .	X	.070	.166	.128	.088	.300
	Y	.262	.237	.284	.211	
	Z	.087	.225	.161	.120	
	XYZ	.146	.234	.204	.131	
Inhibition . . . . .	X	.045	.017	.032	.014	.373
	Y	.001	.045	.028	.013	
	Z	.445	.350	.425	.252	
	XYZ	.228	.186	.221	.117	
Persistence . . . . .	X	.370	.206	.308	.204	.336
	Y	.453	.341	.421	.376	
	Z	.134	.143	.148	.117	
	XYZ	.272	.184	.244	.200	

\* GC = Good Citizenship. I = Information. A = Opinion A. B = Opinion B, or the attitude battery.

† The CAVI sigma score, which may be taken as equivalent to the IQ.

<sup>22</sup> It is evident that *tests of moral knowledge*, the general term applied for the sake of brevity to the measures of social intelligence, or to the measures of social intelligence and attitude, used in the Inquiry report (cf. 132, Vol. III, pp. 38, 46, 76-77, 109, 165-66), may be thought of either as measures of morality or as measures of intellect. To conform with the terminology used in the present research, however, for the purposes of this discussion such tests are considered simply as measures of social intelligence. It should be kept in mind, however, that tests of knowledge, opinion, and attitude are all included under the term as thus defined (cf. 132, Vol. III, pp. 76-77, 165-66). It is further necessary in interpreting the quoted matter reproduced in this connection to substitute for the term *intelligence*, used in the discussion of the coefficients, the term *abstract intelligence*, in order to distinguish it from *social intelligence* as here defined.

"Three combinations of knowledge, opinion, and attitude tests are shown in this table. . . . Surprisingly enough, the highest correlations are between moral knowledge and honesty. . . . The next highest  $r$ 's are between persistence and knowledge; also population Z shows relatively high correspondence between inhibition and knowledge.

"The partial  $r$ 's represent the . . . correlation between such aspects of moral knowledge and such aspects of conduct as are independent of intelligence. Since this is of course an abstraction, all that the partials really convey is the suggestion that the common factor of intelligence (IQ) does not account for all the association observed between knowledge and conduct.

"The last column gives the raw  $r$ 's corrected for attenuation. These represent the maximum correlation one would be likely to find if perfect measures of both knowledge and conduct were available. Even these corrected  $r$ 's are not large enough to give any confidence in the theory that increased knowledge guarantees improved behavior. Not only do many individuals who know better do worse, but also many individuals who know little do well." (132, Vol. III, pp. 165-67)

### *A Summary of the Findings of the Character Education Inquiry*

The correlational results showing the degree of relationship found between various measures of morality and intellect, as reproduced in the foregoing pages, may be summarized by types of evidence as follows:<sup>23</sup>

## RESULTS OF INTELLIGENCE TESTS

### RESULTS OF TESTS OF VERBAL ABSTRACT INTELLIGENCE

#### HONESTY AND INTELLIGENCE

The total range of the 7 uncorrected coefficients of correlation tabulated between various forms of honesty and intelligence is from .030 to .355, and the range of 6 of these coefficients, from .120 to .355; the total range of the 9 coefficients corrected for errors arising from imperfect measures of the abilities tested by the examination on which cheating was permitted is from .040 to .410, and the range of 5 of these coefficients, from .130 to .370; the total range

<sup>23</sup> Throughout this summary, the term *honesty* is substituted for the term *deceit* or its synonyms, and all negative coefficients taken from Volume I of the Inquiry report are interpreted as positive and all positive coefficients are interpreted as negative, in order to restrict consideration to the relation between moral character and intelligence. Furthermore, in this summary coefficients are differentiated as uncorrected or corrected only to the extent that they are so designated in the material quoted in the foregoing analysis.

of the 7 coefficients corrected for these errors and also corrected for attenuation is from .052 to .587, and the range of 5 of these coefficients, from .164 to .465; while the total range of the 8 partial coefficients with age constant is from .100 to .493.

The multiple coefficient of correlation between an unweighted combination of seven of the techniques utilized in measuring honesty and intelligence test score or mental age is .54, and the corresponding partial coefficient with age constant is .60.

#### SERVICE AND INTELLIGENCE

The coefficient of correlation between intelligence and total service score for three populations combined is .161.

#### HONESTY AND THE INTEGRATION OF HONESTY AND INTELLIGENCE

The weighted mean coefficient of correlation corrected for errors of measurement between honesty and intelligence for two populations is .344. The corresponding value for the correlation between integration and intelligence is .266. The partial coefficient of correlation between intelligence and honesty with integration constant is .216, and between intelligence and integration with honesty constant, .003.

#### PERSISTENCE AND INTELLIGENCE

The coefficient of correlation between intelligence and persistence for three populations combined is .147. The partial coefficients of correlation between intelligence and persistence with age constant for three populations range from .126 to .366.

#### INHIBITION AND INTELLIGENCE

The coefficients of correlation between total inhibition score and intelligence for three populations range from .003 to .269.

### RESULTS OF TESTS OF SOCIAL INTELLIGENCE

#### HONESTY AND MORAL KNOWLEDGE

The coefficient of correlation between total moral knowledge and honesty for three populations combined is .390, the corresponding partial coefficient with intelligence quotient constant being .246, and the corrected coefficient, .464.

#### COOPERATION AND MORAL KNOWLEDGE

The coefficient of correlation between total moral knowledge and cooperation for three populations combined is .204, the corresponding partial coefficient with intelligence quotient constant being .131, and the corrected coefficient, .300.

#### INHIBITION AND MORAL KNOWLEDGE

The coefficient of correlation between total moral knowledge and inhibition for three populations combined is .221, the cor-

responding partial coefficient with intelligence quotient constant being .117, and the corrected coefficient, .373.

#### PERSISTENCE AND MORAL KNOWLEDGE

The coefficient of correlation between total moral knowledge and persistence for three populations combined is .244, the corresponding partial coefficient with intelligence quotient constant being .200, and the corrected coefficient, .336.

### REPORTS OF EDUCATIONAL STATUS

#### REPORTS OF AMOUNT OF SCHOOLING

##### HONESTY AND SCHOOL GRADE

The total range of the coefficients of correlation between grade and honesty for all kinds of honesty tested and for all populations is from  $-.272$  to  $+.360$ , the average being approximately zero. Similarly, the range of the 12 coefficients tabulated between grade and honesty is from  $-.272$  to  $+.360$ , the average being  $+.031$ , while the range of the 6 positive coefficients is from  $+.228$  to  $+.360$ .

#### REPORTS OF SCHOOL PROGRESS

##### HONESTY AND RETARDATION

The total range of the 14 partial coefficients of correlation tabulated between age and honesty with grade constant is from  $-.413$  to  $+.195$ , only 4 of these coefficients being positive.

##### HONESTY AND THE INTEGRATION OF HONESTY AND RETARDATION

The coefficients of correlation between honesty and retardation and between integration and retardation in one population are both .001, and in another population are  $-.23$  and  $-.15$ , respectively.

#### REPORTS OF EDUCATIONAL ACHIEVEMENT

##### HONESTY AND SCHOOL ACHIEVEMENT

The total range of the 10 coefficients of correlation tabulated between honesty and school achievement is from  $-.270$  to  $+.200$ , 7 of these coefficients being positive and ranging from  $+.020$  to  $+.200$ .

##### SERVICE AND SCHOOL ACHIEVEMENT

The coefficient of correlation between teachers' marks and total service score for three populations combined is .316.

##### HONESTY AND THE INTEGRATION OF HONESTY AND SCHOOL ACHIEVEMENT

The total range of the coefficients of correlation between honesty

and scholastic achievement and between integration and scholastic achievement is from .114 to .525.

#### PERSISTENCE AND SCHOOL ACHIEVEMENT

The coefficients of correlation between persistence and school grade for three populations range from  $-.004$  to  $+.204$ , 2 of these coefficients being positive.

#### INHIBITION AND SCHOOL ACHIEVEMENT

The coefficients of correlation between resistance to distracting stimuli and academic success for three populations range from  $-.033$  to  $+.371$ , 2 of these coefficients being positive.

It will be observed that all the correlational results summarized in the case of Results of Intelligence Tests are positive and that the greater part of these coefficients fall within the limits defined in the final conclusion of the research, while the correlational results summarized in the case of Reports of Educational Status are positive more often than they are negative but frequently fall below the limits defined. Since Results of Intelligence Tests constitute a more important type of evidence as to the relationship under investigation than do Reports of Educational Status, and since the results of the latter type of evidence tend in the main to be accordant with the results of the former, it is evident that the findings of the Character Education Inquiry afford significant confirmation both as to the nature of the relation and as to the degree of relationship between morality and intellect obtained in the present research.

Lastly, it is important to note that to the extent that the populations of school children which served as subjects in the investigation may be taken as fairly representative of the general population, to the extent that the tests of honesty, service, cooperation, persistence, and inhibition employed may be taken as adequate measures of morality and the tests of intelligence, school grade, retardation, school achievement, and moral knowledge as adequate measures of intellect, and to the extent that the statistical procedures utilized may be considered appropriate and sufficiently refined, to that extent the findings of the Character Education Inquiry may be accepted as establishing the degree of relationship between morality and intellect in the population as a whole for the United States. Even if these findings may not be regarded as decisive with reference to this problem, they are clearly indicative.

## SECTION 3

THE SIGNIFICANCE OF THE RELATIONSHIP REVEALED  
IN THE RESEARCH

The findings of the research may be evaluated not only by reference to the findings of the independent inquiry cited in the preceding section, but also in terms of the significance of the relationship revealed in the research.

Because of the wealth and variety of the evidence represented, the conclusion as to the relation between morality and intellect reached in the present research is of unusual significance. In his volume *The English Convict* Goring points out the great confidence that can be placed in a result obtained from an accumulation of evidence in the following words:

"The precision and certainty . . . of a conclusion resulting from any statistical test, increase with a repetition of the experiment. We may be doubtful whether a correlation ratio value of .15 is, or is not, significant of a real, as opposed to a chance, relationship. But if, resulting from repeated examination of similar data, we obtain a series of results averaging out at .15, our doubt is transformed into approximate certitude: with each additional experiment the chances are enormously increased that the relationship is a real one." (45, p. 127)<sup>24</sup>

At the same time, certain practical limitations of the research should be recognized. In the first place, it does not establish which of the two qualities, morality and intellect, is antecedent and which is consequent. Otis seeks to correct a current mis-

<sup>24</sup> Although the degree of relationship between morality and intellect found in the research tends to be appreciably higher than the figure used by Goring for illustrative purposes in the quotation given above, in view of the fact that a number of the results reported in this volume, including many product-moment coefficients of correlation, are negligible and in some cases even negative, it is well to recall the following warning voiced by Yule in his book *An Introduction to the Theory of Statistics*: "It should be noted that, while  $r$  is zero if the variables are independent, the converse is not necessarily true: the fact that  $r$  is zero only implies that the means of rows and columns lie *scattered round* two straight lines which do not exhibit any definite trend, to right or to left, upward or downward. Two variables for which  $r$  is zero are, however, conveniently spoken of as *uncorrelated*." (214, pp. 174-75)

It may be added that this authority gives in the immediate connection, "an illustration of a case in which the variables are almost uncorrelated but by no means independent,  $r$  being very small ( $-0.014$ ), but the coefficient of contingency  $C$  . . .  $0.47$ " (cf. 214, p. 175).

conception as to the meaning of correlation in his *Statistical Method in Educational Measurement*, as follows:

"... When two variables are correlated, we tend to assume that one is the cause of the other.

. . . . .

"All that is proved when two variables are found to be correlated is that some cause or causes (such as heredity) are operating to produce change in both variables." (171, pp. 230-31)

In the second place, it does not answer the question as to the relative importance of heredity and environment in determining the degree of relationship found. Although certain data cited in the research throw some light on this problem,<sup>25</sup> they are not adapted to settling the question, nor do the results obtained consistently support any one hypothesis.

In the third place, the degree of relationship found in the research is scarcely sufficient for predictive purposes. As indicated in the main statement of findings, a low degree of relationship between morality and intellect, translated into the usual numerical equivalents employed throughout the research, signifies a coefficient of correlation lying between .10 and .39, these figures representing the general trend of the obtained relation, while a coefficient of .50 was given as usually limiting the true relation. The figure representing the true, that is, the theoretical, relation obviously must be interpreted as a corrected coefficient. As such, it has no function to serve in prediction, as Kelley effectively shows in the following passage quoted from his *Statistical Method*:

"... the coefficient of correlation obtained by the use of the Spearman formula for correction for attenuation should never be

<sup>25</sup> Particularly the data reported by Raubenheimer for groups of school boys in socially and educationally privileged and less privileged communities, reviewed in Table IX in Chapter IX; the data reported by Harts-horne and May and their collaborators for a high group (designated X), representing two communities of relatively high social level, and a low group (designated Z), representing a community of relatively low social level, reviewed in the preceding section, other data reported by these investigators also being pertinent; and the data reported by Toops for children of different ages, also reviewed in Table IX in the chapter referred to. Of special interest in this connection are also the analysis of the effect of chronological age included in the interpretation of Table XXVI in Chapter XXVIII, and the discussion of the degree of correlation found for younger as compared with older groups included in the comparison of the correlational results for the different types of groups with identical types of evidence, countries, and types of coefficients in the second section of the preceding chapter.

used for the estimation of one actual measure from a second. This 'corrected' coefficient is a promise of the correlation that one might expect to find between the variables if one had perfectly reliable measures." (154, p. 208)

Accordingly, the question at issue concerns the value for predictive purposes of a coefficient of correlation between morality and intellect lying between .10 and .39.

Authorities differ with respect to the degree of correlation required to be useful for purposes of prediction. The figures given by Otis in the following quotation, taken from the book previously cited, may possibly serve as a minimum standard:

"... though the correlation . . . is .50, the average error of prediction . . . is still almost as great as the average of the errors one would make by mere chance guessing. . . . For purposes of prognosis, therefore, a correlation of .50 is very low indeed." (171, p. 220)

In the volume already referred to Goring suggests a little higher figure, as follows:

"... no degree of association equivalent to a coefficient of less than .6 is of much practical service for individual prediction. . . ." (45, p. 92)

The standard set by Garrett in his *Statistics in Psychology and Education*, however, is much higher than the figures suggested above. He writes:

"It will be noted that  $r$  must be .866 before . . . the standard error of estimate is reduced one-half. For  $r$ 's of .30 and less, the coefficients of alienation are so large that the predictions based on them are but little better than a guess. Even with an  $r = .99$ , . . . the standard error of estimate is still  $\frac{1}{7}$  as large as when  $k = 1.00$ . It is obvious, then, that in order to estimate individual scores with accuracy, the correlation should be at least .90." (144, pp. 289-90)

Clearly, then, the degree of relationship found in the research is insufficient for individual prediction. Nevertheless, the possibility that the correlation between morality and intellect may still have some value for group prediction is suggested by the following quotation taken from Goring's work:

"... the true worth of a correlation coefficient lies in its significance for prediction. . . . But, when dealing with *individual* human qualities or conditions, the range of variability in a pre-



diction will never be reduced to zero, *all* the causes leading to individual variation being at present unascertainable. In fact, the range of variability in the best individual prediction will always be so large as to be practically useless. Statistical knowledge of man, however, is not concerned with individual prediction. The aim of the science of statistics is to predict average, and not individual, values, *i.e.*, values ascertained for men taken in the mass: the values that remain when individual variation has been eliminated. The knowledge of a sufficient number of correlation coefficients may here, if the masses referred to be large enough, reduce the variation of prediction almost to zero. The range of this variation, in a fully completed prediction formula, becomes constricted to the narrow limits of the probable error due to random sampling. That is to say, by dealing with large samples, whose probable error becomes very small, the knowledge of man *in the mass* may become as absolute as an exact science." (45, p. 319)

In spite of the more optimistic outlook regarding the practical value of the research for predictive purposes which characterizes the foregoing quotation, the wiser plan of measuring both qualities, proposed by Poffenberger in an article on measures of intelligence and character as a result of his own conservative conclusion regarding the relation between morality and intellect, may well be advocated. He writes:

"... A survey of the available material on the relation between intelligence and character traits shows that the correlation is positive but that it will probably not go higher than  $+.50$ . This correlation of  $+.50$  accounts for the fact that one can find desirable character traits in persons of very low intelligence. If the presence of one can not be taken as the sign of the presence of the other, then both must be measured. . . .

. . . . .

"Such a combined measure of intelligence and character, if used for vocational purposes, would prevent the waste of high grades of intelligence in positions where it is not needed and would enable those of low intelligence to be located where their capacity would be adequate and where their character traits would make them successful." (176, pp. 263, 265-66)

As a means of emphasizing the findings of the present research and of pointing the way to further needed research, the conclusion and the recommendation voiced by Terman in an article urging research on the diagnosis of pre-delinquent tendencies may be cited:

" . . . There are few things more certain than that *some* correlation exists between intelligence and conduct.

"On the other hand, the correlation is not such as to afford much of a basis for predicting that a mentally inferior individual will probably become delinquent. He may, and indeed is more likely to than the person of average intelligence, but there are far more chances that he will not become delinquent than that he will. Intelligence tests of delinquents are worth while, but they do not carry us very far in the problem with which we are here concerned. Research must be carried into the field of emotional and personality traits if we would develop methods by which delinquent tendencies may be recognized before the individual comes into serious conflict with the law." (106, p. 124)

To this challenge for further research given by Terman, a second challenge based on the findings of this research and the largely confirmatory findings of the Character Education Inquiry may be issued. Building upon the foundations of these researches, future investigators, employing improved measures and refined statistical procedures, and choosing as subjects large numbers of cases so selected as to form a fair sample of the general population, may hope to determine within fairly narrow limits the relation between morality and intellect in the population as a whole in the particular countries investigated.

Finally, it may be pointed out that, although a higher degree of correlation between morality and intellect than the final conclusion of the research indicates may have been anticipated, in view of the many factors affecting the correlational results, doubtless the fact that the individual results of the research show comparatively few instances of negative correlation, and the summarized results with but few exceptions—regardless of the type of evidence, the type of group, the country, and the type of coefficient—show a positive correlation, is a sufficiently impressive outcome. Moreover, it is evident that, in spite of the conservative nature of the conclusion formulated, an affirmative answer can yet be given to the question raised at the beginning of this research. The principle of the mutual relationship of desirable qualities still remains unchallenged: as far as the relation between morality and intellect is concerned, correlation and not compensation is the rule.

## APPENDICES



# APPENDIX I

## SUPPLEMENTARY MATERIAL PERTAINING TO PART I

### SECTION I

#### A STUDY OF THE RELATION BETWEEN DELINQUENCY AND MENTAL DEFICIENCY<sup>1</sup>

The particular problem of this study is to determine the relation between delinquency and mental deficiency in some definite way. Since the degree of delinquency or mental deficiency of an individual in comparison with a selected group may doubtless be determined with a fair degree of accuracy, conclusions based on a correlation of ratings such as these should point toward a definition of the relation that we are seeking. The data in the following pages report the findings of such a study.

The cases chosen to form the selected group, the individuals of which were to be ranked in delinquency and mental deficiency on a scale relative to the total number, were the forty-nine subjects described in Healy's *Case Studies of Mentally and Morally Abnormal Types* (48), and the additional subject described in Healy and Fernald's *Tests for Practical Mental Classification* (51) as Case 574. Subsequently, however, Cases 6 and 7 were excluded from the classification owing to the fact that the former had been given the Binet tests only, and the latter no tests whatever, leaving a total of thirty boys and eighteen girls.

In the first place, in order to justify the hypothesis that it is possible to determine the relative delinquency within a group of any or all of the individuals, ten cases were selected from the Healy Case Book to be ranked in delinquency. The basis of selection was arbitrary, as all the boys tested by the Binet scale, a total of seven, and three typical cases to whom the Binet tests had not been applied, were included.

The material was arranged for each case in a uniform manner under the divisions of age, nationality, physical condition, school record, parentage, delinquency, and environment. Mimeographed sheets containing these data were then presented to classes, including both men and women, in Social Psychology and Abnormal Psychology with the following instructions:

<sup>1</sup> The study reported in this section, barring minor verbal changes and relatively unimportant alterations and omissions, reproduces the major part of a quantitative study of this problem included in a thesis entitled *The Relation between Delinquency and Mental Deficiency*, prepared by the author of the present volume, and presented to Northwestern University in partial fulfillment of the requirements for the degree of Master of Arts in the Department of Psychology in 1914. The original thesis was placed in the Library of Northwestern University.

Rank these cases from 1 to 10 according to your estimate of their undesirability as members of such a community as this in which we live.

The total number of students whose rankings were used was seventy-two, the rankings of four other students having been excluded because of failure to follow instructions. The cases were similarly ranked separately by a chief probation officer and by the writer. Their rankings together with the total ranking for the psychology classes and the average deviations of the latter are given in Table 1. The correlations between columns, obtained by the method of rank-differences, are also shown.

TABLE 1  
RANKING OF TEN HEALY CASES

Healy Case No.	Probation Officer	Writer	Total for Psychology Classes	A. D. of Total for Psychology Classes
3 .....	2	2	3	2.48
6 .....	5	10	6	2.18
8 .....	6	3	2	1.69
14 .....	10	5	9	2.30
16 .....	1	1	1	1.49
32 .....	3	4	4	2.36
44 .....	7	9	7	1.81
12 .....	8	7	8	1.79
13 .....	9	8	10	1.57
15 .....	4	6	5	1.94

Correlation between ranking by probation officer and ranking by writer = 0.58

Correlation between ranking by probation officer and total ranking for psychology classes = 0.87

Correlation between ranking by writer and total ranking for psychology classes = 0.74

Correlation between rankings by two psychology classes (not shown in table) = 0.92

Since the ranking of delinquency made by an expert corresponded closely to that made by the groups mentioned above, the judgment of a few persons experienced in the field of criminology appeared to be an adequate criterion in the ranking of the delinquency of a larger number of cases. Hence four experts were requested to grade the subjects described in the Healy Case Book into four groups according to the degree of delinquency. Owing to the failure of these men, however, to indicate clearly the basis of grading, an average of their groupings only was considered.

The managing editor of an important criminological publication and the writer graded the forty-nine cases previously mentioned, including also Case 574, into an equal number of groups. Their basis of grading was as follows: Group A includes those who show a negligible degree of delinquency; Group B, those who show a slight degree of delinquency; Group C, those who show

TABLE 2  
GROUPING OF CASES

Healy Case No.	Moral Group				Mental Group
	Experts	Editor	Writer	Final	
1 .....	A	A	A	A	B
2 .....	B	B	C	B	B
3 .....	D	B	D	D	C
4 .....	B	A	A	A	D
5 .....	C	C	C	C	A
8 .....	C	C	C	C	B
9 .....	D	A	A	A	C
10 .....	D	A	D	D	D
11 .....	D	D	C	D	A
12 .....	C	D	C	C	B
13 .....	D	D	C	D	B
14 .....	D	D	D	D	D
15 .....	C	D	D	D	C
16 .....	C	D	D	D	C
17 .....	D	D	D	D	B
18 .....	D	C	D	D	B
19 .....	D	A	B	B	C
20 .....	C	D	D	D	B
21 .....	D	A	B	B	B
22 .....	C	D	D	D	B
23 .....	D	D	D	D	B
24 .....	C	D	D	D	A
25 .....	A	A	A	A	A
26 .....	A	B	B	B	D
27 .....	B	B	B	B	A
28 .....	A	A	A	A	C
29 .....	B	D	D	D	A
30 .....	D	D	C	D	A
31 .....	B	C	C	C	A
32 .....	D	B	D	D	C
33 .....	C	B	D	C	A
34 .....	D	D	D	D	B
35 .....	B	B	D	B	C
36 .....	C	C	C	C	A
37 .....	D	D	C	D	D
38 .....	D	D	C	D	B
39 .....	D	D	C	D	B
40 .....	D	D	D	D	A
41 .....	B	B	B	B	C
42 .....	D	D	C	D	B
43 .....	D	D	C	D	C
44 .....	C	C	B	C	D
45 .....	D	D	D	D	A
46 .....	C	C	C	C	C
47 .....	C	B	C	C	A
48 .....	C	B	B	B	C
49 .....	C	D	D	D	B
574 .....		C	C	C	A

a decided degree of delinquency with, at most, slight repetition of serious offenses; and Group D, those who show a maximum degree of delinquency.

The degree of agreement between the three groupings was striking, and justified at once the assignment of a permanent group to each case. An agreement of any two of the groupings, or, where this did not occur, an average of the three groupings, was taken as the basis of the final assignment. The preliminary and the final groups for the forty-eight cases who could also be classified on the basis of mentality are given in Table 2 on the preceding page.

The next step was the ranking of the cases from 1 to 48, Cases 6 and 7, previously referred to, having been eliminated. In this final grading the boundaries set by the different groups as already determined were retained, but the ranking within the groups was determined by the writer alone. This final ranking of the relative degree of delinquency is given in Table 3. It is necessarily a more or less arbitrary one, but it represents, nevertheless, a most serious attempt at a consideration of all the details of delinquency.

TABLE 3  
RANKING OF CASES

Healy Case No.	Rank in Morality	Rank in Mentality	Healy Case No.	Rank in Morality	Rank in Mentality
1 .....	1	23	27 .....	7	13
2 .....	11	15	28 .....	4	42
3 .....	33	39	29 .....	29	1.5
4 .....	5	45.5	30 .....	26	12
5 .....	22	1.5	31 .....	18	6
8 .....	20	29	32 .....	32	32.5
9 .....	2	32.5	33 .....	21	4
10 .....	37	43.5	34 .....	30	20
11 .....	25	10.5	35 .....	13	36.5
12 .....	23	21	36 .....	19	8
13 .....	24	22	37 .....	36	43.5
14 .....	44	45.5	38 .....	35	34.5
15 .....	42	40	39 .....	38	24.5
16 .....	47	41	40 .....	43	14
17 .....	27	18.5	41 .....	8	32.5
18 .....	41	17	42 .....	31	27.5
19 .....	10	36.5	43 .....	28	32.5
20 .....	48	26	44 .....	14	47
21 .....	9	27.5	45 .....	39	10.5
22 .....	46	30	46 .....	16	35
23 .....	40	18.5	47 .....	17	3
24 .....	34	5	48 .....	12	38
25 .....	3	9	49 .....	45	16
26 .....	6	48	574 .....	15	7

Correlation between rank in morality and rank in mentality = - 0.02



After the rank in morality for these cases had been determined, the next problem was the determination of the rank in mentality. The only bases for this ranking were the results of the application of the Healy tests, which were not standardized, and the results of the Binet tests, which had been given to but thirteen of the cases under consideration.

At the outset the writer entertained hopes that the standardization of the Healy tests might be feasible from the data at hand. With this end in view, then, a selection was made from the Case Book of all the cases representing each chronological age which appeared to be of normal mentality, judged by the grade reported as reached in school. There are, of course, serious objections to this standard of normality, but it seemed to be the most practicable one available in this case. The cases thus selected were to be used as standards for comparison.

Case 574, a boy fifteen years of age, presented by Healy after a thorough study of over five hundred previous cases as a typical juvenile court case, who had an exceptionally good record in the tests, was used as an additional standard for his age.

It was found, however, that an average of the results of a given test for the subjects representing a particular age, when compared with the average of these results representing another age, presented no adequate standard increasingly higher for each succeeding year. In a number of instances the record of the younger subjects was equal to or surpassed that of the older. The conclusion was reached, therefore, that the standardization of the tests in the Healy Case Book, *per se*, was impossible.

The study, however, had made clear the possibility of establishing approximate norms for the various ages in each test, and, by so doing, of arriving at a reasonable qualitative evaluation of the record made by a subject of a given age in a test in comparison with that made by other subjects of the same age. By the aid, then, of the so-called standard cases, a tentative requirement in all the tests, progressively greater for each succeeding age, was established. If the record of the subject in a particular test was good as compared with this requirement, a grade of 1 for that test was given; if only fair, a grade of 3; and if poor or failure, a grade of 5. Since the number of tests given to any one subject ranged from two to twenty-two, the average grade per test for each subject was found by dividing the sum of the grades assigned to the tests by the number of tests taken. This quotient was the criterion of classification.

The groups to which the cases were then assigned for comparison with the moral groups were defined as follows: Group A includes those whose average was below 2; Group B, those whose average was below 3; Group C, those whose average was below 4; and Group D, the remainder. These groups are recorded in Table 2, already referred to.

Subsequently the cases were ranked from 1 to 48, the numerical averages already obtained being taken as the basis for ranking in every instance. This rank in mentality and the correlation between the two rankings are shown with the rank in morality in Table 3.

The final ranking as to the relative degree of delinquency and mental deficiency having thus been obtained, the correlation between the two rank-

ings by the method of rank-differences was found to be  $-0.02$ . This result shows practically a zero correlation, and signifies that, as far as we have been able to ascertain by a quantitative study, no relation between delinquency and mental deficiency exists.

It is apparent that such a result, however, might depend entirely upon the mental measure used, which was in this instance the Healy tests. Hence the thirteen subjects in the Case Book tested by the Binet scale as well were separately graded in delinquency and mental deficiency. The rank in morality was determined on the basis of the ranks already assigned. The rank in mentality was determined by the intelligence quotient, computed by dividing the mental age of each subject as found by the Binet scale by his chronological age. The correlation between the rank in morality and the rank in mentality according to the Binet scale by the method of rank-differences was  $0.35$ . However, the correlation between the rank in morality and the rank in mentality according to the Healy tests for the same group of thirteen subjects was  $0.24$ ; and the correlation between the rankings in mentality according to the Binet scale and the Healy tests was  $0.77$ . Although the correlation between delinquency and mental deficiency thus obtained by the use of the Healy tests for this smaller group of subjects is no longer negative, the fact that the results of the two series of tests show a high positive correlation suggests that the correlation between delinquency and mental deficiency obtained by the use of the Binet scale for the entire group, were we able to determine their rank in mentality by this means, might not be far different from that already found by the use of the Healy tests. A record of this ranking and the correlations based upon it is given in Table 4.

It has been surprising indeed to find such a lack of correlation between delinquency and mental deficiency, since the conviction among authorities as well as in the popular mind is to the effect that a causal relationship between the two does exist. Evidently some explanation of the discrepancy must be sought. If such a connection as has been assumed is indeed a fact, then in one of two sources, perhaps in both, error must be found.

One of these possible sources of error lies in the method of ranking delinquency. The only possible method, however,—that of social reaction to the relative seriousness of offenses,—has been utilized. The heinousness of an offense is a relative matter, dependent upon the time, the particular group affected, and social conventions. Criminal laws are but expressive of social estimates of delinquency. The group of students and the experts to whom the cases previously mentioned were referred undoubtedly were guided to a large extent in their judgments by the social atmosphere in which they are accustomed to live and work.

The other possible source of error lies in a fault in the systems of mental tests now in vogue. If the essential lack of the delinquent be in volition rather than in intelligence, as Kauffmann among others believes (cf. 56, pp. 25-30, 223-24), then the tests must be so modified that they will unequivocally get at this deepest root of the whole mental process, an achievement for which they seem not now to be adequate. Further, it is an open question whether tests are now adapted to discover the capacity of the individual

TABLE 4  
RANKING OF CASES TESTED BOTH BY BINET SCALE AND  
BY HEALY TESTS

Healy Case No.	Rank in Morality	Rank in Mentality	
		Binet	Healy
1 .....	1	4	2
3 .....	9	12	6
4 .....	3	9	11.5
5 .....	7	1	1
8 .....	6	2	3
10 .....	11	7	9.5
14 .....	12	8	11.5
16 .....	13	10	7
28 .....	2	6	8
32 .....	8	5	4.5
37 .....	10	11	9.5
41 .....	4	3	4.5
44 .....	5	13	13

Correlation between rank in morality and rank in mentality according to

Binet scale = 0.35

Correlation between rank in morality and rank in mentality according to

Healy tests = 0.24

Correlation between rankings in mentality according to Binet scale and

Healy tests = 0.77

for improvement over his past record and for self-control. It is at least possible that when tests shall have been revised to meet these essential requirements, data relating to the mental status of delinquents may be obtained that will affirm, or once and for all deny, a close correlation between mental condition and delinquency.

## SECTION 2

A STUDY OF THE RELATION BETWEEN CHARACTER AND  
INTELLECT<sup>1</sup>By *Laura M. Chassell*<sup>2</sup>

A positive correlation between character and intellect has been found by the writer in a study of approximately one hundred graduates of Teachers College, Columbia University, who received the degree of Doctor of Philosophy with Education as the major subject during the years 1899 to 1914, inclusive.<sup>3</sup> The data upon which the study was based consisted of ratings by members of the instructional staff of the College made during a two-year period beginning three years after the latest of the graduation dates, and records of standing in the preliminary written examination required of candidates for the doctorate.

The measures of character and intellect employed were the following:

1. Ratings in character made by six professors in the Faculties of Education and Practical Arts.<sup>4</sup>
2. Ratings in intelligence made by five professors in the two Faculties, including three who had assigned ratings in character, and by one other officer of instruction.<sup>5</sup>
3. Ratings in success achieved as scholar-investigator-author made by six professors in the Faculty of Education, only one of whom had assigned ratings in character.<sup>6</sup>
4. Ratings as to quality of the dissertation made by seven professors in the two Faculties, only two of whom had assigned ratings in character, and by three other officers of instruction.<sup>7</sup>

<sup>1</sup> This study is based on findings reported in a book by the writer, entitled *Qualities Associated with Success in Educational Leadership*, to be published by the Bureau of Publications, Teachers College, Columbia University, New York City.

<sup>2</sup> The writer is indebted to Clara Chassell Cooper for suggestions during the preparation of the study and for collaboration in the final revision of the text.

<sup>3</sup> Because of inadequacies in the records of Teachers College graduates, four persons who were found, subsequent to the collection of some of the data and the beginning of their correlational analysis, to have received the degree of Doctor of Philosophy from Columbia University but not from Teachers College were included among the subjects for the study, one of these having been graduated in 1898. They were as well known to the judges, however, as the Teachers College graduates. Three of the number were graduated with Psychology as the major subject and Education as the first minor, and the fourth with Philosophy as the major subject and Ethics as the first minor.

<sup>4</sup> The judges in character included three professors, one associate professor, and two assistant professors.

<sup>5</sup> The judges in intelligence included one professor, one associate professor, three assistant professors, and one associate.

<sup>6</sup> The judges in success achieved as scholar-investigator-author included five professors and one associate professor. One of the number was a member of the Faculty of Practical Arts as well as of the Faculty of Education.

<sup>7</sup> The judges as to quality of the dissertation included three professors, four assistant professors, two associates, and one instructor. The ratings assigned by these members of the instructional staff, however, provided such fragmentary data that supplementary ratings for use in a part of the statistical work were obtained in the case of a number of dissertations from one of the original judges and from an eleventh series of ratings assigned by a member of the staff of the Appointment Committee.

5. Records of standing in the preliminary written examination required of candidates for the degree of Doctor of Philosophy, available in the office of the Registrar of Teachers College.<sup>8</sup>

The customary procedure in assigning the ratings in a given trait<sup>9</sup> was for a judge to distribute the names of the subjects with whom he was familiar into ten groups according to the merit of the subjects in the trait under consideration. In the case of the ratings as to quality of the dissertation, however, the titles of the dissertations rather than the names of the subjects were distributed (the authors of the dissertations being indicated only by their key numbers), unfamiliar titles first being discarded.<sup>10</sup>

The data secured were handled in the following manner to permit the calculation of uncorrected and corrected coefficients of correlation :

In the case of each measure for which ratings were secured, the ratings of the judges were distributed into two paired series, the ratings of one half of the judges constituting one series and the ratings of the other half of the judges constituting the other series; then a series of scores was computed to represent each series of ratings. For character, intelligence, and success achieved as scholar-investigator-author these scores were medians of ratings. For quality of the dissertation the scores were the results of two complicated procedures, each of which was applied to the paired series of ratings, thus providing paired series of scores in the case of both methods, and each of which credited the number of judges rating a given dissertation as well as the crude value of the dissertation as indicated by the ratings, special statistical treatment being accorded the ratings in this instance because the data were unusually fragmentary in character.<sup>11</sup> Paired series of scores were thus obtained by one or more techniques for each measure for which ratings were secured; and these paired series constituted the two independent series of measures which were utilized in the routine calculation of uncorrected and corrected coefficients.

In the case of the measure obtained from the records of standing in the preliminary written examination, a single series of numerical values, or

<sup>8</sup> Data relating to this examination were obtainable only in the case of approximately four-fifths of the persons generally included in the study, and retained for statistical treatment only in the case of approximately three-fifths. The principal reason for absence of data was the fact that the examination was evidently not required at Teachers College of those working toward the doctorate in the earlier years of the period studied.

Throughout the years to which the data secured applied, 1904-1914, the examination invariably included regularly the three fundamental subjects, History of Education, Philosophy of Education, and Educational Psychology. During a part of this period the examination also regularly covered the three other general educational departments of the College: Educational Administration, Secondary Education, and Elementary Education, but later included instead the special field in which the candidate had done his major work. The data respecting the latter item, however, proved too fragmentary for statistical use.

<sup>9</sup> The ratings in character, intelligence, and success achieved as scholar-investigator-author were assigned during the school year 1917-18, and the ratings as to quality of the dissertation, about a year later.

<sup>10</sup> As would naturally be expected, the judges who assigned the ratings differed greatly in their familiarity with the dissertations, as well as in their familiarity with the authors of these dissertations.

<sup>11</sup> The first method used in deriving these scores was a rule-of-thumb procedure devised by Dr. E. L. Thorndike and developed by the writer, whereas the second method used was a rigorous statistical procedure devised and developed by Dr. T. L. Kelley. The results obtained by the two methods proved to be in essential agreement, correlating to the extent of .95.

scores, was derived by a flexible procedure, which was adapted to certain characteristics of the data but provided essentially for the crediting of a record in terms of the quality of work done in each subject. This single series of scores was paired in turn with each of the series of scores for character in the calculation of the alternate uncorrected coefficients; and an estimated reliability coefficient of .8<sup>12</sup> was utilized in the correction for attenuation formula to determine the corrected coefficient.

The coefficients of correlation between the ratings in character and the various measures of intellectual capacity and achievement as obtained by the product-moment method are presented in the accompanying table.

COEFFICIENTS OF CORRELATION BETWEEN RATINGS IN CHARACTER AND VARIOUS MEASURES OF INTELLECTUAL CAPACITY AND ACHIEVEMENT

Measure of Intellect	No. of Judges <sup>a</sup>	No. of Cases	Coefficients of Correlation <sup>b</sup>							
			Reliability Coefficient <sup>c</sup>		Uncorrected Coefficients				Corrected Coefficient	
			I <sub>1</sub> I <sub>2</sub>		C <sub>1</sub> I <sub>2</sub>		C <sub>2</sub> I <sub>1</sub>		C I	
			r	P.E.	r	P.E.	r	P.E.	r	P.E.
Ratings in intelligence	6	92 <sup>d</sup>	.59	±.05	.39	±.06	.47	±.05	.71	±.09
Ratings in success achieved as scholar-investigator-author	6	105 <sup>e</sup>	.86	±.02	.38	±.06	.36	±.06	.51	±.08
Ratings as to quality of dissertation	10 <sup>f</sup>	105								
Method 1			.58	±.04	.22	±.06	.12	±.06	.27	
Method 2			.53	±.05	.21	±.06	.06	±.07	.20	
Records of standing in preliminary written examination		62	(.80) <sup>g</sup>		.33	±.08	.32	±.08	.46	

<sup>a</sup> The number of judges supplying the ratings in character, the measure of character employed, was 6.

<sup>b</sup> I<sub>1</sub>I<sub>2</sub> is the symbol used to indicate the reliability coefficient for any one of the four measures of intellect employed; whereas C<sub>1</sub>I<sub>2</sub> is the symbol used to indicate the uncorrected coefficients of correlation between the first series of scores for the one measure of character and the second series of scores for the first three measures of intellect, and between the first series of scores for the one measure of character and the single available series of scores for the fourth measure of intellect, C<sub>2</sub>I<sub>1</sub> has a converse significance, and C I is the symbol designating the derived corrected coefficients.

<sup>c</sup> The reliability coefficient for ratings in character, the single measure of character, to which the symbol C<sub>1</sub>C<sub>2</sub> may be applied, is .62 ±.04 for the group of 105 cases represented.

<sup>d</sup> The number of cases represented by the reliability coefficient for ratings in intelligence was 93.

<sup>e</sup> The number of cases represented by the reliability coefficient for ratings in success achieved as scholar-investigator-author was 106.

<sup>f</sup> The ratings supplied by the 10 judges specified in the table received some supplementation in the case of one of the methods employed in the treatment of fragmentary data. Thus, to meet the requirements of Method 1, ratings were obtained for the dissertations which had not originally received ratings from any of the judges whose ratings comprised the first series of measures, and for those which had not originally received ratings from any of the judges whose ratings comprised the second series of measures, from special ratings made by one of the original judges or from an eleventh series of ratings assigned by a member of the staff of the Appointment Committee, or from both these sources.

<sup>g</sup> Estimated.

<sup>12</sup> This estimate was based on data concerning the reliability of college marks collected by Clara F. Chassell.

These coefficients of correlation seem upon rough inspection to indicate a notably higher degree of relationship between character and intellect for three of the four measures of intellect. The three instances in which the correlation with character appears to be substantial are intelligence, success achieved as scholar-investigator-author, and standing in the preliminary written examination. The degree of correlation in the three instances as indicated by the means of the two alternate uncorrected coefficients is, respectively, .43, .37, and .33, and as indicated by the corresponding corrected coefficients, .71, .51, and .46. The degree of correlation between character and quality of the dissertation as indicated by the mean of the four alternate uncorrected coefficients calculated from the scores obtained by two methods for the treatment of fragmentary data is .15, and as indicated by the mean of the corresponding corrected coefficients, .24.<sup>18</sup>

An examination of the facts concerning the data from which the coefficients given in the table were derived, however, indicates that a number of factors affect the degree of relationship found in a given case. These include the particular members of the group for whom the measures correlated were available, the varying length of time which had elapsed since the graduation of the different subjects, the publicity accorded to individual members of the group, the degree and the recency of acquaintance with the subjects on the part of the judges, the number of judges assigning the ratings in a particular trait and for an individual subject, the competence of the judges to rate in the traits designated, the ability of the judges to differentiate among the various traits and to think of a particular trait rather than the general merit of a subject in rating, the duplication of the judges for the several traits, the time to which a particular trait referred in relation to a subject's period of study and his career subsequent to graduation, the time of rating in respect to the event judged, the objectivity of the traits considered, the amount of overlapping of abilities from one trait to another, the fragmentary character of the data for certain measures, and the appropriateness and comprehensiveness of the variables selected as measures of intellect. To these considerations may be added the variability in the number of cases for the different coefficients, the reliability of the data involved, the magnitude of the coefficients in relation to their probable errors, the agreement between the alternate coefficients, the magnitude of the correlations with other measures of character and intellect, and, lastly, the extreme restriction in range characteristic of the group studied, with its consequent effect upon the degree of relationship found.

Limitations of space permit a mere enumeration of these factors. A careful study of the known facts concerning such influences, however, leads to the selection of the correlation with success achieved as scholar-investigator-author as the preferred measure of the relation between character and intellect, and as generally superior to the correlation with intelligence, which is probably too high; and to a recognition of the theoretical interest which attaches to the correlations with quality of the dissertation and with standing in the preliminary written examination from the viewpoint of prognosis.

<sup>18</sup> In calculating the means reported for both uncorrected and corrected coefficients, the original figures carried out to four decimal places were used.

## SECTION 3

THE PRINCIPLES OF SELECTION FOLLOWED IN EXCLUDING  
CERTAIN MEASURES OF CHARACTER AND PERSONALITY  
AND IN CLASSIFYING RATINGS AS TO INTELLIGENCE

The principles of selection followed in excluding certain measures of character and personality and in classifying ratings as to intelligence were based on the classifications of traits used by Terman and his associates in their investigation of gifted children (cf. 189, pp. 519-29, 538-42), and the classifications of personality and character tests employed by May and Hartshorne (162), (163), and by May, Hartshorne, and Welty (164), in their reviews of such tests.

The classifications of traits used by Terman and his associates served as guides in the present research for distinguishing moral traits from emotional and volitional traits on the one hand, and from intellectual traits representing both abstract and social intelligence on the other. The method of classifying certain traits utilized in the investigation of gifted children and the use made of these classifications in the present research in excluding measures other than measures of moral character are indicated below:

In the revised classification of traits used in the major investigation of gifted children certain traits were classed as moral, others as emotional, and others as volitional; similarly, in the earlier classification of traits used in a preliminary experiment certain traits were classed as social, including traits which corresponded to the moral traits in the revised list,<sup>1</sup> others as emotional, and others as will and activity.<sup>2</sup>

In tabulating studies of the relation between moral character and intelligence in the present research, the moral traits in the revised list, the selection of social traits in the earlier list which corresponded to the moral traits in the revised list,<sup>3</sup> and allied traits in the literature were accepted as representing moral character; whereas the emotional and the volitional traits in the revised list, the emotional traits and the will and activity traits in the earlier list, and allied traits in the literature were rejected.

The method of classifying certain traits utilized in the investigation of gifted children and the use made of these classifications in the present research in classifying ratings as to intelligence are indicated below:

In the revised classification of traits used in the major investigation of gifted children certain traits were classed as intellectual, and others as social; similarly, in the earlier classification of traits used in a preliminary experiment certain traits were classed as mental abilities, and others as social, including traits which corresponded to the social traits in the

<sup>1</sup> No traits were designated as moral in the earlier list.

<sup>2</sup> Special ability traits and physical traits included in the revised list and psychophysical traits included in the earlier list are omitted from consideration in this discussion.

<sup>3</sup> And, in addition, the trait *cooperativeness*.



revised list, and in addition traits which corresponded to the moral traits in the revised list, as previously indicated.

In tabulating studies of the relation between moral character and intelligence in the present research, the intellectual traits in the revised list, the mental abilities traits in the earlier list, and allied traits in the literature were taken to represent abstract intelligence; whereas the social traits in the revised list, the selection of social traits in the earlier list which corresponded to the social traits in the revised list,<sup>4</sup> and allied traits in the literature were taken to represent social intelligence.<sup>5</sup>

The classifications of personality and character tests employed by May and Hartshorne or by May, Hartshorne, and Welty served as guides in the present research for distinguishing measures of morality from measures of the emotional and volitional aspects of character, and from measures of ethical discrimination or judgment. Certain features of the methods of classification utilized in the reviews of personality and character tests and the use made of these classifications in the present research in excluding measures other than measures of moral character are indicated below:

In the earliest of the reviews of personality and character tests cited, published in 1925, the various objective methods of measuring character described were classified as tests claiming to measure ethical, moral, social and religious discrimination and judgment, tests claiming to measure [certain] character and personality traits,<sup>6</sup> and tests claiming to measure interests, attitudes, prejudices, etc., and instincts and emotions. In the two later reviews of personality and character tests cited, published in 1926 and 1927, certain measures of character and personality were classified as batteries including various assemblages of tests intended to measure more than a single trait,<sup>7</sup> others as tests and techniques intended primarily to measure objectively (and mainly in terms of conduct) certain personality traits and types of behavior, others as tests and testing techniques intended to measure primarily the affective aspects of personality,<sup>8</sup> and others as tests and techniques intended to measure primarily social-ethical ideas and judgment.<sup>9</sup>

In tabulating studies of the relation between moral character and intelligence in the present research, batteries of tests listed in these reviews and elsewhere in the literature were classified as measures of that aspect of personality which the series as a whole purported to measure, and accepted or rejected as measures of moral character according to the aspect of personality involved; the tests claiming to measure [certain] character and personality traits in the first classification, and the tests and techniques intended primarily to measure objectively (and mainly in terms of con-

<sup>4</sup> Exclusive of the trait *cooperativeness*, as already indicated.

<sup>5</sup> Except that the trait *mechanical ingenuity* would have been taken to represent mechanical intelligence, and the various traits designated by the word *interest* or *interests* would have been discarded for the sake of conformity with exclusions in the classifications of personality and character tests about to be discussed, if they had been found correlated with a moral trait in the literature.

<sup>6</sup> The names of the traits are given in outline form in the source, accompanied by the name of the author of the test.

<sup>7</sup> The qualifying phrase given above was not used in the 1926 classification.

<sup>8</sup> The sub-classes utilized in this instance are of especial importance because of their relation to the classes used in the earlier review. They were instincts and emotions, mood and temperament, and attitudes, interests, preferences, prejudices, etc.

<sup>9</sup> Other classes used in one or both of these reviews which are not pertinent to the present discussion are omitted from consideration.

duct) certain personality traits and types of behavior in the second classification, and allied tests described elsewhere in the literature which were measures of moral traits as previously delimited were accepted as representing moral character; and the remaining tests and techniques enumerated in the case of both classifications, and allied measures described elsewhere in the literature were rejected.

# APPENDIX II

## SUPPLEMENTARY MATERIAL PERTAINING TO PART II

### SECTION I

#### A KEY TO THE INSTITUTIONS COOPERATING IN THE INVESTIGATION OF THE RELATION BETWEEN MORAL AND INTELLECTUAL TRAITS<sup>a</sup>

KEY NO. OF INSTITUTION	GEOGRAPHICAL LOCATION	NAME OF INSTITUTION	AFFILIATION OR CONTROL <sup>b</sup>	TYPE OF INSTITUTION <sup>b,c</sup>	COLLEGES OR COURSES OF STUDY REPRESENTED BY GROUP OF SENIORS FOR WHOM RATINGS WERE REQUESTED <sup>d</sup>
1	Arkansas	University of Arkansas	State	Coeducational	*Colleges of Agriculture Arts and Sciences, Education, Engineering
2	California	Pomona College	Congregational	Coeducational	*Liberal Arts course
3	Connecticut	Wesleyan University	Methodist Episcopal	Men's	†Courses in Arts and Science
4	District of Columbia	George Washington University	Non-sectarian	Coeducational	†Teachers College
5	District of Columbia	Howard University	Non-sectarian	Coeducational, Negro	†College of Arts and Sciences
6	Georgia	Atlanta University	Non-sectarian	Coeducational, Negro	†College course
7	Georgia	Georgia School of Technology	State	Men's	††Regular course
8	Idaho	University of Idaho	State	Coeducational	Colleges of †Agriculture, Engineering, Law, †Letters and Science
9	Iowa	Cornell College	Methodist Episcopal	Coeducational	*College of Liberal Arts
10	Iowa	Des Moines College	Baptist	Coeducational	†College of Liberal Arts
11	Iowa	Simpson College	Methodist Episcopal	Coeducational	*†College of Liberal Arts
12	Kansas	Washburn College	Congregational	Coeducational	*College
13	Kentucky	Transylvania College	Disciples of Christ	Coeducational	†Courses in Arts and Science
14	Maine	Bates College	Non-sectarian	Coeducational	*Courses in Arts and Science
15	Mississippi	University of Mississippi	State	Coeducational	*College of Liberal Arts
16	Missouri	William Woods College	Christian	Girls' boarding	*Courses in Arts and Sciences, Expression, and Music
17	Montana	State College of Agriculture and Mechanic Arts	State	Coeducational	Colleges of †Agriculture, †Applied Science, †Engineering, Household and Industrial Arts

KEY NO. OF INSTI- TUTION	GEOGRAPH- ICAL LOCATION	NAME OF INSTITUTION	AFFILIATION OR CONTROL <sup>b</sup>	TYPE OF INSTITUTION <sup>bc</sup>	COLLEGES OR COURSES OF STUDY REPRESENTED BY GROUP OF SENIORS FOR WHOM RATINGS WERE REQUESTED <sup>d</sup>
18	Nebraska	Creighton University	Roman Catholic	Coeducational	Colleges of †Arts, Dentistry, †Law, Medicine, Pharmacy
19	<i>Nevada</i>	<i>University of Nevada</i>	<i>State</i>	<i>Coeducational</i>	<i>*‡College of Arts and Science</i>
20	<i>Ohio</i>	<i>Heidelberg University</i>	<i>Reformed</i>	<i>Coeducational</i>	<i>*Literary Department</i>
21	<i>Ohio</i>	<i>Municipal University of Akron</i>	<i>Municipal</i>	<i>Coeducational</i>	<i>*College of Liberal Arts</i>
22	<i>Pennsylvania</i>	<i>Lincoln University</i>	<i>Presbyterian</i>	<i>Men's, Negro</i>	<i>*College</i>
23	<i>Pennsylvania</i>	<i>Swarthmore College</i>	<i>Friends</i>	<i>Coeducational</i>	<i>*‡‡Courses in Arts and Applied Science</i>
24	South Dakota	University of South Dakota	State	Coeducational	†College of Arts and Sciences
25	<i>Tennessee</i>	<i>Maryville College</i>	<i>Presbyterian</i>	<i>Coeducational</i>	<i>*Liberal Arts course</i>
26	<i>Texas</i>	<i>Baylor University</i>	<i>Baptist</i>	<i>Coeducational</i>	<i>*Liberal Arts course</i>
27	Utah	University of Utah	State	Coeducational	†School of Arts and Sciences
28	<i>Washington</i>	<i>Whitman College</i>	<i>Non-sectarian</i>	<i>Coeducational</i>	<i>*Courses in Arts, Science, and Music</i>

\* In this key the sixteen selected institutions are distinguished from the twelve non-selected institutions by the use of italics. It should be noted, however, that Institution 23 was classified among the selected institutions only in the case of ratings by faculty judges.

<sup>b</sup> The authority followed was *Patterson's American Educational Directory* for 1917 (173). The information given in this source, however, was subject to qualification as indicated in the succeeding footnote.

<sup>c</sup> If a question arose as to whether an institution was restricted to a given sex or was coeducational in the colleges or courses of study represented by the group of seniors for whom ratings were requested, the question was settled by reference to the list of senior names received from the institution in question.

Information regarding race is given only in the case of institutions for Negro students.

<sup>d</sup> The symbols used in this column are to be explained as follows:

\* Members of the senior class in the colleges or the courses of study indicated are represented in the routine correlational results obtained for selected institutions reported in Part II, Chapter XIX.

† Members of the senior class in the colleges or the courses of study indicated are represented in the routine or irregular correlational results obtained for non-selected institutions reported in Appendix II, Section 3.

‡ Members of the senior class in the colleges or the courses of study indicated are represented in the supplementary coefficients of correlation calculated for selected institutions reported in Appendix II, Section 3.

## SECTION 2

DETAILED RULES GOVERNING THE REPORT AND THE INTER-  
PRETATION OF ROUTINE CORRELATIONAL RESULTS  
OBTAINED FOR SELECTED INSTITUTIONS<sup>1</sup>

1. Do not report corrected coefficients under the following circumstances:

*a.* In cases in which one of the reliability coefficients involved in the correction for attenuation is negative.

*b.* In cases in which the reliability coefficient for one of the traits correlated is so high as to indicate with practical certainty that an objective measure of the trait in question had been consulted by the judges before assigning their ratings.

*c.* In cases in which the reliability coefficient for one of the measures correlated is not at least 2 P.E., or practically so.

2. Italicize corrected coefficients and exclude them from consideration in the interpretation of results and from combining in any compilation of correlational results under the following circumstances:

*a.* If the reliability coefficient for one of the measures correlated is less than 3 P.E., unless the reliability coefficient for the second measure correlated is greater than 5 P.E.

*b.* If the difference between the alternate coefficients involved in the correction for attenuation is greater than  $3\frac{1}{2}$  P.E. of the smaller coefficient.

3. Exclude the alternate coefficients which correspond to omitted or italicized corrected coefficients from consideration in the interpretation of results, and likewise (if pertinent) from all compilations of correlational results, because the particular data involved fail to meet the standards of reliability or of consistency formulated above.

<sup>1</sup> It may be noted that these rules are closely related in certain respects to the standards defined for certain criteria employed in the evaluation of the data, as given in Appendix II, Section 4.



KEY NO. OF INSTI- TUTION	FINAL GRADE ASSIGNED TO RATINGS	NO. OF STUDENTS RETAINED AS SUBJECTS	CORRELATIONAL RESULTS				KEY NO. OF INSTI- TUTION <sup>a</sup>	NO. OF STUDENTS RETAINED AS SUBJECTS	CORRELATIONAL RESULTS <sup>b</sup>			
			OBTAINED FROM RATINGS BY ONE JUDGE						OBTAINED FROM RATINGS BY ONE JUDGE			
			RAW COEFFICIENTS						RAW COEFFICIENTS			
			$M_1IS_1$	$M_1IA_1$	$IS_1IA_1$				$M_1IS_1$	$M_1IA_1$	$IS_1IA_1$	
17	E	32	.65	.58	.65		*11	11	.13	.36	.66	
4	E	15	.03	.39	.62		*23	10	.58	.42	.77	
3	E	15	.39	.43	-.09		*19	13	.76	.54	.84	
13	E	7	.59	.16	.14		†7	10	.90	.62	.57	
5	E	10	.39	.94	.39		†18	8	.38	.00	.88	
27	E	9	.48		.47							

## KEY TO SYMBOLS

*M* Morality in the Broadest Sense. *IS* Intellect as Shown in Studies. *IA* Intellect as Shown in Activities Other than Studies.

*Subscript 1* First Half of Data or Single Series of Ratings. *Subscript 2* Second Half of Data.

<sup>a</sup> Symbols used in this column are to be explained as follows:

\* Coefficients of correlation for this institution obtained from ratings by other judges are reported in Part II, Chapter XIX.

† Coefficients of correlation for this institution obtained from ratings by other judges are reported above.

‡ Coefficients of correlation for this institution for another group of students are reported above.

<sup>b</sup> As the information given in the preceding footnote suggests, the correlational results tabulated in this minor division of the section are in every case supplementary coefficients of correlation; that is, coefficients calculated for individual faculty judges in the case of institutions with 2 or more other retained judges.

<sup>c</sup> The uniform omission of the trait *Usefulness* in the results reported for Institution 23 is due to the comparatively small number of ratings assigned in that trait as a result of unsatisfactory manifoldings.

<sup>d</sup> This figure is calculated on the basis of nine traits, as in the case of the institutions for which results are reported in Part II.





## CORRELATIONAL RESULTS

OBTAINED FROM RATINGS BY TWO OR MORE JUDGES

ALTERNATE COEFFICIENTS (Concluded)

KEY NO. OF INSTITUTION	$S_1S_2$	$S_1A_1$	$S_1A_2$	$S_2A_1$	$A_1IS_2$	$A_2IS_1$	$A_1A_2$	$A_2A_1$	$R_1IS_2$	$R_2IS_1$	$R_1A_2$	$R_2A_1$	$IS_1A_2$	$IS_2A_1$
23	-.39	.15	-.15	.26	.17	.38	-.16	.33	.13	.14	.20	-.14	.26	-.23

OBTAINED FROM RATINGS BY ONE JUDGE

RAW COEFFICIENTS (Concluded)

KEY NO. OF INSTITUTION	$S_1IS_1$	$S_1A_1$	$A_1IS_1$	$A_1A_1$	$R_1IS_1$	$R_1A_1$	$IS_1A_1$
4	.35	.73	.68	.67	.70	.87	.65
6	-.20	-.53	-.09	.18	-.15	-.49	.64

## KEY TO SYMBOLS

*U* Unselfishness.    *L* Loyalty to School and Friends.    *J* Justice to All.    *C* Courage in Support of Convictions.    *S* Self-Control.    *A* Activity for Social Welfare.  
*R* Reliability.    *IS* Intellect as Shown in Studies.    *IA* Intellect as Shown in Activities Other than Studies.  
*Subscript 1* First Half of Data or Single Series of Ratings.    *Subscript 2* Second Half of Data.

\* The footnotes to Section 3 will be found on page 513.



OBTAINED FROM RATINGS BY ONE JUDGE											
RAW COEFFICIENTS (Continued)											
	L <sub>1</sub> J <sub>1</sub>	L <sub>1</sub> C <sub>1</sub>	L <sub>1</sub> S <sub>1</sub>	L <sub>1</sub> A <sub>1</sub>	L <sub>1</sub> R <sub>1</sub>	J <sub>1</sub> C <sub>1</sub>	J <sub>1</sub> S <sub>1</sub>	J <sub>1</sub> A <sub>1</sub>	J <sub>1</sub> R <sub>1</sub>		
4	.73	.76	.65	.71	.80	.66	.33	.68			
6		.46	.40	.00	.49				.69		

  

CORRELATIONAL RESULTS											
OBTAINED FROM RATINGS BY TWO OR MORE JUDGES											
ALTERNATE COEFFICIENTS (Continued)											
KEY NO. OF INSTITUTION	C <sub>1</sub> S <sub>2</sub>	C <sub>2</sub> S <sub>1</sub>	C <sub>1</sub> A <sub>2</sub>	C <sub>2</sub> A <sub>1</sub>	C <sub>1</sub> R <sub>2</sub>	C <sub>2</sub> R <sub>1</sub>	S <sub>1</sub> A <sub>2</sub>	S <sub>2</sub> A <sub>1</sub>	S <sub>1</sub> R <sub>2</sub>	S <sub>2</sub> R <sub>1</sub>	A <sub>1</sub> R <sub>1</sub>
23	-.16	.14	-.55	.24	-.17	.38	-.16	-.41	-.13	.26	.21

  

OBTAINED FROM RATINGS BY ONE JUDGE											
RAW COEFFICIENTS (Continued)											
	C <sub>1</sub> S <sub>1</sub>	C <sub>1</sub> A <sub>1</sub>	C <sub>1</sub> R <sub>1</sub>	S <sub>1</sub> A <sub>1</sub>	S <sub>1</sub> R <sub>1</sub>	A <sub>1</sub> P <sub>1</sub>					
4	.75	.49	.65	.48	.67	.83					
6	-.30	.13	-.27	-.05	.45	-.10					

## KEY TO SYMBOLS

U Unselfishness. L Loyalty to School and Friends. J Justice to All. C Courage in Support of Convictions. S Self-Control. A Activity for Social Welfare.  
 R Reliability. IS Intellect as Shown in Studies. IA Intellect as Shown in Activities Other than Studies.  
 Subscript 1 First Half of Data or Single Series of Ratings. Subscript 2 Second Half of Data.

\* The footnotes to Section 3 will be found on page 513.

## SECTION 4\*

A DEFINITION OF THE STANDARDS FOR THE CRITERIA EMPLOYED IN THE EVALUATION OF THE DATA WITH THE GRADES ASSIGNED AS THE RESULT OF EACH CRITERION

EVALUATION OF INDIVIDUAL CRITERIA		INDIVIDUAL CRITERIA WITH NO. OF CREDITS ASSIGNED TO EACH					
GRADE CORRESPONDING TO STANDARD <sup>a</sup> OPPOSITE	WEIGHT CORRESPONDING TO GIVEN GRADE	CRITERION 1		CRITERION 2		CRITERION 3	
		NO. OF STUDENTS RETAINED AS SUBJECTS <sup>b</sup> (5 CREDITS)		PERCENTAGE OF STUDENTS FOR WHOM RATINGS WERE REQUESTED REPRESENTED BY STUDENTS RETAINED AS SUBJECTS <sup>b</sup> (2 CREDITS)		AV. NO. OF JUDGES RETAINED IN EACH TRAIT <sup>b</sup> (3 CREDITS)	
A	4	STUDENT JUDGES		STUDENT JUDGES		STUDENT JUDGES	
		FACULTY JUDGES	STUDENT JUDGES	FACULTY JUDGES	STUDENT JUDGES	FACULTY JUDGES	STUDENT JUDGES
		42 or more	Standard 42 or more	100	Standard 100	5 or more	Standard 10 or more
		2, 9, 11, 14, 23, 26	Institutions 9	4, 12, 14, 16, 20, 21, 22, 25, 28	Institutions 6, 16, 21, 22, 28	1, 6, 12, 16, 20, 22, 25, 28	Institutions 9, 16, 21
		32-41	Standard 32-41	78-99	Standard 78-99	4 or more	Standard 8 or more
B	3	1, 12, 17, 20, 22	Institutions 22	1, 10, 11, 17, 26	Institutions 9	10, 11, 21	Institutions 22
		More than 4.00	Standard More than 8.00	6, 16, 20, 22, 25, 28	Institutions 9, 16, 21	More than 3.00	Standard More than 6.00
		10, 12, 14, 21	Institutions 22	10, 12, 14, 21	Institutions 22	10, 12, 14, 21	Institutions 22

C	2	22-31	Standard 22-31	56-77	Standard 56-77	3 or more	Standard 6 or more	More than 2.00	Standard More than 4.00
		7, 21, 25, 28	Institutions 21, 28	2, 6, 9, 19	Institutions 4	14, 19, 23	Institutions 22	1, 11, 19, 23, 24, 26, 28	Institutions
D	1	12-21	Standard 12-21	34-55	Standard 34-55	2 or more	Standard 4 or more	More than 1.00	Standard More than 2.00
		3, 4, 8, 10, 15, 16, 18, 19	Institutions 16, 23	8, 13, 15, 23, 24, 27	Institutions	2, 9, 15, 24, 26	Institutions 28	2, 7, 8, 9, 15, 18	Institutions
E	0	Fewer than 12	Standard <sup>c</sup> Fewer than 12	Under 34	Standard Under 34	Fewer than 2	Standard Fewer than 4	1.00 or fewer	Standard 2.00 or fewer
		5, 6, 13, 24, 27	Institutions 4, 6	3, 5, 7, 18	Institutions 23	3, 4, 5, 7, 8, 13, 17, 18, 27	Institutions 4, 6, 23	3, 4, 5, 13, 17, 27	Institutions
Total No. of Institutions		28	8	28	8	28	8	28	8

\* The footnotes to Section 4 will be found on page 521.

## SECTION 4 (Concluded)

EVALUATION OF INDIVIDUAL CRITERIA			INDIVIDUAL CRITERIA WITH NO. OF CREDITS ASSIGNED TO EACH				COMBINED CRITERION AND RESULTING EVALUATION			
GRADE	CORRESPONDING TO GIVEN STANDARD'S OPPOSITE	WEIGHT ASSIGNED TO COEFFICIENTS	CRITERION 5		CRITERION 6		QUANTITATIVE AND QUALITATIVE SUMMARY OF CREDITS	STUDENT JUDGES	FINAL GRADE ASSIGNED TO RATINGS	QUALITATIVE WEIGHT ASSIGNED TO COEFFICIENTS
			RELIABILITY OF RATINGS AS EVIDENCED BY RELATION OF RELIABILITY COEFFICIENTS TO THEIR PROBABLE ERRORS (4 CREDITS)	CONSISTENCY OF RATINGS AS EVIDENCED BY AGREEMENT BETWEEN ALTERNATE COEFFICIENTS (3 CREDITS)	FACULTY JUDGES	STUDENT JUDGES				
A	4		$r_{11}$ = at least 5 P.E. in 3 traits	<i>Standard</i> $r_{11}$ = at least 5 P.E. in 4 or more moral and 2 intellectual traits <sup>a</sup>	Diff. between each pair not > 2½ P.E. of larger $r$ for 3 pairs	<i>Standard</i> <sup>d</sup> Diff. between pairs not > 2½ P.E. of larger $r$ for at least 9 moral-intellectual trait correlation pairs and 14 moral trait inter-correlation pairs, and not > 3½ P.E. of smaller $r$ for all pairs	12 or more credits of Grade A, with no credits below Grade B	<i>Standard</i> 12 or more credits of Grade A, with no credits below Grade B	A	4
			2, 11, 12, 14, 20, 21, 25, 28	<i>Institutions</i>	1, 2, 6, 12, 15, 22, 23, 25	<i>Institutions</i>	12, 20	<i>Institutions</i> 9		
B	3		$r_{11}$ = at least 4 P.E. in 3 traits	<i>Standard</i> $r_{11}$ = at least 4 P.E. in 4 or more moral and 2 intellectual traits; or $r_{11}$ = at least 5 P.E. in 4 or more moral traits and 1 intellectual trait, and = at least 3 P.E. in other intellectual trait	Diff. between each pair not > 2½ P.E. of smaller $r$ for 3 pairs	<i>Standard</i> Diff. between pairs not > 2½ P.E. of smaller $r$ for at least 9 moral-intellectual trait correlation pairs and 14 moral trait inter-correlation pairs, and not > 3½ P.E. of smaller $r$ for all pairs	12 or more credits of Grades A or B, with no credits below Grade C	<i>Standard</i> 12 or more credits of Grades A or B, with no credits below Grade C	B	3
			6, 16, 22	<i>Institutions</i>	14, 16, 20	<i>Institutions</i>	12, 20	<i>Institutions</i> 1, 14, 22, 25		
C	2		$r_{11}$ = at least 3 P.E. in 3 traits	<i>Standard</i> $r_{11}$ = at least 3 P.E. in 4 or more moral and 2 intellectual traits; or $r_{11}$ = at least 4 P.E. in 4 or more moral traits and 1 intellectual trait, and = at least 2 P.E. in other intellectual trait	Diff. between each pair not > 3½ P.E. of smaller $r$ for 3 pairs	<i>Standard</i> Diff. between pairs not > 3½ P.E. of smaller $r$ for at least 13 moral-intellectual trait correlation pairs and 19 moral trait inter-correlation pairs	12 or more credits of Grades A, B, or C, with no credits below Grade D	<i>Standard</i> 12 or more credits of Grades A, B, or C, with no credits below Grade D	C	2
			1	<i>Institutions</i>	19	<i>Institutions</i>	2, 11, 16, 21, 23, 28	<i>Institutions</i> 2, 11, 16, 21, 23, 28		

D	1	Standard $r_{11}$ = at least 3 P.E. in 2 or 1 of 3 traits represented	Standard $r_{11}$ = at least 3 P.E. in 4 or more moral traits and 1 intellectual trait	Diff. between each pair not $> 3\frac{1}{2}$ P.E. of smaller $r$ for 2 or 1 of 3 pairs	Standard Diff. between each pair not $> 3\frac{1}{2}$ P.E. of smaller $r$ for at least 11 moral-intellectual trait correlation pairs and 17 moral trait inter-correlation pairs <sup>a</sup>	Standard 20 credits of Grades A, B, C, or D	D	1
		<i>Institutions</i> 9, 15, 19, 23, 24, 26, 22		9, 10, 11, 21, 24, 26, 28	<i>Institutions</i> 9, 15, 19, 26			
E	0	Standard $r_{11} < 3$ P.E. in 3 traits; or fewer than 3 or no $r_{11}$ 's could be calculated	Standard $r_{11} < 3$ P.E. in 4 or more moral or 2 intellectual traits; or no $r_{11}$ 's could be calculated	Diff. between each pair $> 3\frac{1}{2}$ P.E. of smaller $r$ for 3 pairs; or routine series could not be calculated	Standard Diff. between each pair $> 3\frac{1}{2}$ P.E. of smaller $r$ for 4 or more moral-intellectual trait correlation pairs or 5 or more moral trait inter-correlation pairs; or routine series could not be calculated	Standard 1 or more credits of Grade E	E	0
		<i>Institutions</i> 3, 4, 5, 7, 8, 10, 13, 17, 18, 27	<i>Institutions</i> 3, 4, 5, 7, 8, 13, 17, 18, 27	<i>Institutions</i> 3, 4, 5, 7, 8, 13, 17, 18, 27	<i>Institutions</i> 3, 4, 5, 6, 7, 8, 10, 13, 17, 18, 24, 27			
Total No. of Institutions		28	8	28	8	28	8	Total No. of Institutions

<sup>a</sup> Each standard below the highest presupposes as its upper limit, even if not so stated, a requirement just below that of the next higher standard.  
<sup>b</sup> The supplementary coefficients of correlation calculated for selected or non-selected institutions reported in Appendix II, Section 3, are disregarded in this criterion.  
<sup>c</sup> The upper limit of the standard for Grade E was determined by the fact that P.E.'s (if taken only to the nearest second decimal place) never exceed .20 except in the case of populations under 12. This statement would hold in the case of P.E.  $r$ 's only for populations of 10 cases or fewer, that is, for populations under 11 (cf. 197, pp. 63-64).  
<sup>d</sup> The following question was submitted by the author to Professor T. L. Kelley in a letter dated August 1, 1927: "Is there any rule as to how great divergences between paired correlations (i.e., correlations obtained from alternative random half pairings, as  $r_{11}$ 's and  $r_{12}$ 's) is permissible for such  $r$ 's to be used in the correlation of attendance formula?" Professor Kelley's reply was as follows: "No rule formulated by me would suggest that  $r_{11}$ 's should not differ from  $r_{12}$ 's by more than  $2\frac{1}{2}$  P.E.  $r_{11}$ 's or  $2\frac{1}{2}$  P.E.  $r_{12}$ 's." This recommendation was therefore taken as the basis of the standard for Grades A and B.  
<sup>e</sup> That is, more than one-half of the seven moral traits and both of the intellectual traits.  
<sup>f</sup> That is, approximately two-thirds of the fourteen routine moral-intellectual trait correlation pairs and two-thirds of the twenty-one routine moral trait intercorrelation pairs, the one intellectual trait intercorrelation pair being disregarded in this part of the statement.  
<sup>g</sup> That is, all but one of the fourteen routine moral-intellectual trait correlation pairs and all but two of the twenty-one routine moral trait intercorrelation pairs.  
<sup>h</sup> That is, approximately four-fifths of the fourteen routine moral-intellectual trait correlation pairs and the twenty-one routine moral trait intercorrelation pairs.  
<sup>i</sup> For any group whatsoever, or for as many as one-third of the students for whom ratings were requested.  
<sup>j</sup> The uniform omission of the trait *Unselfishness* in the calculations for an institution as a result of unsatisfactory manifold was disregarded.

## SECTION 5

THE ADAPTED POINT SYSTEMS USED IN THE EVALUATION OF  
EXTRA-CURRICULAR ACTIVITIES*A. For the Four-Year Coeducational Institutions*

ACTIVITY	NO. OF POINTS	ACTIVITY	NO. OF POINTS
<b>ATHLETICS</b>		Secretary .....	16
<i>Athletic Association</i>		Treasurer .....	16
President .....	20	Member of Cabinet .....	16
Member of Athletic Board .	8	Member of Advisory Board or Student Adviser .....	16
Cheer Leader .....	4	Member of Sub-Cabinet .....	8
Member of Association ....	2	Big Sister Captain .....	8
Women's Athletic Manager .	16	Annual Member .....	3
<i>Baseball</i>		Delegate .....	3
Member of Varsity Team ..	12	Member of Association .....	1
Member of Class Team ....	6	<b>CLASS ORGANIZATIONS</b>	
<i>Basket Ball</i>		President .....	4
Manager .....	14	Other Officer .....	2
Member of Varsity Team...	14	<b>DEPARTMENTAL CLUBS</b>	
Captain .....	4	President .....	4
Captain-Elect .....	2	Other Officer .....	2
Member of All Star Team ..	7	Member .....	1
Member of Class Team.....	7	Winner of Mathematics Prize .	3
<i>Cross Country or Track</i>		<b>HONOR SOCIETIES</b>	
Winner of Track Medal ....	12	President .....	4
Member of Varsity Team ..	8	Member .....	1
<i>Football</i>		<b>LITERARY SOCIETIES, FRATERNI- TIES, OR SORORITIES</b>	
Manager .....	16	President .....	8
Member of Varsity Team ..	16	Vice-President .....	4
Captain .....	5	Secretary .....	4
Captain-Elect .....	3	Treasurer .....	4
Member of Class Team ....	8	Critic .....	4
<i>Hockey</i>		Member of Pan-Hellenic Coun- cil .....	2
Member of All Star Team ..	6	Member of Organization .....	1
Member of Class Team ....	6	<b>MUSICAL ORGANIZATIONS</b>	
<i>Tennis</i>		<i>Band</i>	
Member of Team .....	12	Member .....	6
<i>Wrestling</i>		<i>Chorus</i>	
Inter-Collegiate Champion .	16	Member .....	4
<b>CHRISTIAN ASSOCIATIONS</b>			
President .....	26		
Vice-President .....	16		



ACTIVITY	NO. OF POINTS	ACTIVITY	NO. OF POINTS
<i>Glee Club</i>		<i>College Paper</i>	
Pianist .....	18	Editor or Managing Editor .	26
Member .....	16	Associate Editor .....	20
Reader .....	10	Assistant Editor .....	18
<i>Oratorio Society</i>		Editor of Special Number ..	4
Member .....	4	Manager or Business Man- ager .....	20
<i>Orchestra</i>		Member of Staff .....	16
Member .....	6	<b>SOCIAL ACTIVITIES</b>	
<i>Quartette</i>		Member of "Junior Prom" Com- mittee .....	2
Pianist .....	6	<b>STATE OR COUNTY CLUBS</b>	
Member .....	4	President .....	4
<b>PEP CLUB</b>		Other Officer .....	2
Member .....	16	Member .....	1
<b>PROHIBITION CLUB OR LEAGUE</b>		<b>STUDENT GOVERNMENT</b>	
President .....	8	<i>Cooperative Government Associa- tion</i>	
Other Officer .....	2	President .....	28
Member .....	1	President of Men's or Wom- en's Council .....	16
<b>PUBLIC SPEAKING</b>		Member of Council or Stu- dent Senate .....	8
<i>Oratory and Debate Board</i>		<i>Residence Hall</i>	
President .....	8	President .....	8
Other Officer .....	4	Other Officer .....	4
<i>Debate</i>		<i>Student Body</i>	
Inter-Collegiate Debater ...	16	Secretary .....	16
Inter-Society Debater .....	10	<i>Student Council</i>	
Inter-Class Debate Winner .	13	President .....	28
<i>Oratory</i>		Other Officer .....	16
Representative in State Ora- torical Contest .....	16	Member .....	8
University Orator .....	16	<i>Upper Class Advisers</i>	
Society Commencement Or- ator .....	10	Chairman .....	16
Winner of Class Oratorical Contest .....	10	<i>Women's League</i>	
Participant in Class Orator- ical Contest .....	8	President .....	28
<b>PUBLICATIONS</b>		<b>STUDENT VOLUNTEER BAND</b>	
<i>College Annual</i>		President .....	4
Associate Editor .....	12	Member .....	1
Manager or Business Man- ager .....	15	<b>UNLISTED ORGANIZATIONS</b>	
Member of Board or Staff ..	10	Principal Officer .....	4
		Other Officer .....	2
		Member .....	1

*B. For the Junior College for Women*

ACTIVITY	NO. OF POINTS	ACTIVITY	NO. OF POINTS
ATHLETICS		Other Officer .....	3
Member of Basket Ball Team .	5	Member .....	1
Member of Track Team .....	3	LITERARY SOCIETIES	
CHRISTIAN ASSOCIATION		President .....	8
President .....	10	Other Officer .....	4
Vice-President .....	6	Member .....	2
Secretary .....	6	MUSICAL ORGANIZATIONS	
Member of Cabinet .....	6	Member of Glee Club .....	5
Delegate .....	2	Member of Orchestra .....	3
Member of Association .....	1	Member of Ukulele Club .....	1
CLASS ORGANIZATIONS		PUBLICATIONS	
President of Junior or Senior		Editor-in-Chief of Record and	
Class .....	10	Annual .....	20
Other Officer of Junior or Senior		Assistant Editor .....	13
Class .....	5	Business Manager .....	20
President of High School Class	8	Member of Staff .....	8
Other Officer of High School		STUDENT GOVERNMENT	
Class .....	4	House Chairman .....	20
Participant in Junior Essay Con-		Member of Student Executive	
test .....	4	Council .....	10
DEPARTMENTAL CLUBS		Proctor .....	8
President .....	10	UNLISTED ORGANIZATIONS	
Other Officer .....	5	Principal Officer .....	5
Member .....	2	Other Officer .....	3
HONOR SOCIETY		Member .....	1
President .....	6		

# APPENDIX III

## SUPPLEMENTARY MATERIAL PERTAINING TO PART III

### SECTION I

#### A KEY TO THE SCHOOLS INCLUDED IN THE INVESTIGATION OF THE RELATION BETWEEN CONDUCT AND INTELLIGENCE

KEY NAME OF SCHOOL	GEOGRAPHICAL LOCATION	NAME OF SCHOOL
	<i>New York</i>	
Private A	New York City	Horace Mann School
Private B	New York City	Social Motive School
Private C	Scarborough	Scarborough School
Private D	Riverdale-on-Hudson	Riverdale Country School
Public A	New York City	Public School 64, Manhattan
	<i>New Jersey</i>	
Public B	Newark	Public Schools

## SECTION

DETAILED INFORMATION REGARDING THE DATA UTILIZED IN THE  
LATION CALCULATED BETWEEN SCORES

## A. For Single

KEY NAME OF SCHOOL	GRADE OR CLASS	SEX	NO. OF PUPILS	MEASURES		CORRELATIONAL RESULTS			
				CONDUCT	INTELLI- GENCE				
Private A	STUDY 1								
	III IV V VI	B, G B, G B, G B, G	23 26 28 30	CITIZEN- SHIP SCALES	MENTAL SURVEY SCALE	RAW COEFFICIENT WITH PROBABLE ERROR			
						ASCS MSS			
				F, H A, C A, B E, H	No. 1	.17±.14 .52±.10 .39±.11 .24±.12			
Private A	STUDY 2A								
	I II (Teacher a) ° II (Teacher b) III III (Open Air) III-IV IV (Open Air) V-VI	B, G B, G B, G B, G B B, G G B, G	4 14 14 6 4 8 1 11	CITIZEN- SHIP CHART	BINET- SIMON SCALE	RAW COEFFICIENT WITH PROBABLE ERROR			
						CCS IQ			
				Chart II	IQ	.42±.15 .01±.18			
Private A	STUDY 2B AND STUDY 3 <sup>d</sup>								
	I II III IV V	B, G B, G B, G B, G B, G	19 21 15 14 22	CITIZEN- SHIP SCALES	BINET- SIMON SCALE	RAW COEFFICIENTS WITH PROBABLE ERRORS			
						ASCS IQ	ASCS MA		
				Regular Grades and Opportunity Classes					
Private B	III ° IV † V-VI	B, G B, G G	6 8 8	C, D C, D C, D	IQ, MA				
Private C	I II	B, G B, G	7 8	G, H G, H	IQ, MA				
Private D	III*	B	13	G, H	IQ, MA		.43±.15		

2\*

THREE STUDIES AND SUPPLEMENTARY COEFFICIENTS OF CORRELATION IN CONDUCT AND INTELLIGENCE<sup>a</sup>Grades or Classes<sup>b</sup>

KEY NAME OF SCHOOL	GRADE OR CLASS	SEX	No. OF PUPILS	MEASURES		CORRELATIONAL RESULTS		
				CONDUCT	INTELLI- GENCE			
Public A	STUDY 2B AND STUDY 3 <sup>d</sup> (Concluded)							
					CITIZEN- SHIP SCALES	BINET- SIMON SCALE	RAW COEFFICIENTS WITH PROBABLE ERRORS	
							ASCS IQ	ASCS MA
	Regular Grades and Opportunity Classes (Concluded)							
	IBa <sup>b</sup>	B	24	G, H	IQ, MA	.08±.14	.13±.14	
	IIBa <sup>b</sup>	B	37	A, B		-.04±.11		
	IIAa <sup>i</sup>	B	11	A, B		.82±.07		
	IIAa <sup>i</sup>	B	31	C, D		.24±.11		
	Op. IIA-IIB (low)	B	28	C, D		.57±.09		
	IIBc	B	29	C, D		-.22±.12		
	IIBb	B	44	C, D		.03±.10		
	Op. IIB-IIB (Terman)	B (B, G) <sup>j</sup>	14 (21) <sup>i</sup>	G, H		.10±.15		
	IIIAb <sup>b</sup>	B	41	A, B		.14±.10		
	IIIAa <sup>b</sup>	B	46	G, H		.11±.10		
	Op. VB-VIA (Terman)	B, G	23	E, F	.11±.14	.18±.14		
Op. VIIA (Terman)	B, G	23	E, F	-.12±.14	-.05±.14			
Public A	Ungraded and Binet Classes							
	Ungraded I	B	17	E, F	IQ, MA	.11±.16		
	Ungraded II	B	16	E, F		.32±.15		
	Ungraded III	B	15	E, F		.20±.17		
	Ungraded IV	B	11	G, H		-.28±.19		
Public B	Very low-grade	B, G	15	E, F	IQ, MA		.28±.16	
	Low-grade	G	11	G, H		-.02±.20		
	Low-grade	B, G	15	E, F			-.29±.16	
	Low-middle-grade	B	14	G, H				
	Low-middle-grade <sup>k</sup>	B	14	G, H				
	Low-middle-grade <sup>b</sup>	B	10	C, D			-.40±.18	
	Low-middle-grade <sup>l</sup>	B, G	8	C, D				
	Middle-grade	G	13	G, H				
	Middle-grade	B	16	E, F			.00±.17	
	Middle-grade	B	15	A, B			.20±.17	
	Middle-grade	G	11	A, B				
	Middle-grade	G	7	E, F				
	Middle-grade <sup>m</sup>	G	7	C, D				
	Middle-grade	B	11	C, D				
	Middle-grade	B, G	8	C, D				
	Middle-high-grade <sup>n</sup>	B	15	G, H			.08±.17	
	Middle-high-grade	B	15	G, H			-.30±.16	
	Middle-high-grade	G	14	E, F			.45±.14	
	Middle-high-grade	B	15	C, D			.22±.17	
	High-grade	B	11	A, B				
	High-grade <sup>k</sup>	B	11	E, F				
	High-grade	B	12	E, F				
	High-grade <sup>k</sup>	B	9	C, D				

## KEY TO SYMBOLS

ASCS Average Scale Conduct Score.  
IQ Intelligence Quotient.

MSS Mental Survey Score.  
MA Mental Age. B Boys.

CCS Chart Conduct Score.  
G Girls.

\* The footnotes to Section 2 will be found on page 530.

SECTION 2\* (Concluded)  
B. For Combined Grades or Classes<sup>o</sup>

KEY NAME OF SCHOOL	GRADES OR CLASSES	SEX	No. of PUPILS	MEASURES		CORRELATIONAL RESULTS							
				CONDUCT	INTELLI- GENCE								
STUDY 2b AND STUDY 3													
				CITIZENSHIP SCALES	BINET- SIMON SCALE	PAIRED SCALES							
						RELIABILITY, ALTERNATE, OR RAW COEFFICIENTS WITH PROBABLE ERRORS							
						SCS <sub>1</sub> SCS <sub>2</sub>	SCS <sub>1</sub> IQ	SCS <sub>2</sub> IQ	SCS <sub>1</sub> MA	SCS <sub>2</sub> MA	SCS <sub>1</sub> CA	SCS <sub>2</sub> CA	MA CA
				<i>Regular Grades and Opportunity Classes</i>									
Private A Private A Public A	I, II, III IV, V IB, IIA, IIB, IIA, Op. IIA - IIB (low)	B, G B, G B	55 36 291	A, B, F, H A, B, C A, B, C, D, G, H	IQ, MA	.83±.03	.32±.08	.12±.09	-.10±.09	-.21±.09	-.41±.08	.51±.07	
					IQ, MA	.89±.02	.41±.09	.28±.10	-.31±.10	-.29±.10	.24±.11		
					IQ, MA	.95±.00	.40±.03	.39±.03	-.32±.04	-.33±.04	.29±.04		
					IQ, MA	.91±.01	-.01±.08	.09±.08	.10±.08	.14±.08	.11±.08	.92±.01	
Public A	Op. IIB - IIB (Terman), Op. VB - VIA (Terman), Op. VIIA (Terman)	B, G	(67) <sup>a</sup>	E, F, G, H	<i>Ungraded and Binet Classes</i>								
Public B Public B	Very low-, low-, low-middle- grade Middle-, middle-high-, high- grade	B, G B, G	87 (194) <sup>a</sup>	C, D, E, F, G, II A, B, C, D, E, F, G, II	IQ, MA	.88±.02	.12±.07	.08±.07	.23±.07	.08±.07	.13±.07	-.05±.07	
					IQ, MA	.90±.01	-.07±.05	-.13±.05	.02±.05	.21±.05	.17±.05	.39±.04	

	CITIZENSHIP SCALES	BINET-SIMON SCALE	POOLED SCALES*				RAW COEFFICIENT OF FIRST ORDER			
			RAW COEFFICIENTS OF ZERO ORDER WITH PROBABLE ERRORS							
			ASCS MA	ASCS CA	MA CA	ASCS MA,CA				
Regular Grades and Opportunity Classes										
Private A	I, II, III, IV, V	91	.18±.07	-.03±.07	.80±.03		.35			
Private B	III, IV, V-VI	(23) <sup>a</sup>	.12±.14	-.04±.14	.71±.07		.21			
Private C	I, II	15	-.36±.15	-.43±.14	.80±.06		-.04			
Public A	IIA, IIB, Op. IIA-IIB (low), Op. IIB-IIB (Terman), Op. IIB-VIA (Terman), Op. VIIA (Terman)	(247) <sup>p</sup>	.46±.03	.19±.04	.82±.01		.55			
Public A	IIA, IIB, Op. IIA-IIB (low)	180	-.05±.05							
Public A	IIIA	87	.36±.06							
Ungraded and Binet Classes										
Public A	Ungraded I, II, III, IV	59	.15±.09	.11±.09	.65±.05		.11			
Public B	Very low, low-grade	41	.14±.10							
Public B	Middle-grade	(91) <sup>t</sup>	-.01±.07							
Public B	Middle-high-grade	59	.09±.09							
Public B	High-grade	(45) <sup>t</sup>	.01±.10							
KEY TO SYMBOLS										
SCS	Scale Conduct Score.	IQ	Intelligence Quotient.	MA	Mental Age.	CA	Chronological Age.	ASCS	Average Scale Conduct Score.	
		Subscript 1	First Measure.				B	Boys.	G	Girls.

KEY TO SYMBOLS  
*SCS* Scale Conduct Score. *IQ* Intelligence Quotient. *MA* Mental Age. *CA* Chronological Age. *ASCS* Average Scale Conduct Score.  
*Subscript 1* First Measure. *Subscript 2* Second Measure. *B* Boys. *G* Girls.

\* The footnotes to Section 2 will be found on page 530.

<sup>a</sup> The information tabulated in the two divisions of this section applies to the data utilized in the three studies as reported in Part III, as well as to the supplementary coefficients of correlation reported in this section, with the exception of information enclosed in parentheses in the columns for sex and number of pupils, which applies only to the coefficients tabulated opposite. Except as otherwise indicated in the succeeding footnotes, pupils in the single grades and classes listed in this division of the section were excluded in the calculation of the correlational results reported in Part III and Appendix III only for the following reasons: (1) some of the required information with respect to ratings in conduct or intelligence test results were lacking; or (2) a different pair of scales had been used in rating 1 or more (but fewer than 5) tested pupils in a given class from the pair of scales used in rating a majority of the members of the class, either because the pupils in question had been transferred and were rated by a different teacher from the other members of the group or for some other reason.

<sup>b</sup> One of the pupils in this group was excluded in the calculation of the correlational results because of an irregularity in the method of rating.

<sup>c</sup> One of the following classes in the private and public schools represented in these studies for whom ratings in conduct were available were excluded in the calculation of the correlational results either because no pupils whatever or because fewer than 5 pupils had had an individual intelligence test which was considered reliable:

Private School A, Grade VI.

Private School B, Grades II and VII-VIII.

Public School A, Ungraded Classes V and VI.

<sup>d</sup> One of the pupils in this group was excluded in the calculation of the correlational results because a discrepancy of 1 year was found in the records consulted for information regarding chronological age; and a second, because the intelligence quotient was not considered reliable and the pupil in question had not been retested, as had the other children tested about the same time.

<sup>e</sup> One of the pupils in this group was excluded in the calculation of the correlational results because the pupil in question had apparently been transferred and was rated by a different teacher from the other members of the group.

<sup>f</sup> One of the pupils in this group was excluded in the calculation of the correlational results because a discrepancy of 1 year was found in the records consulted for information regarding chronological age.

<sup>g</sup> The number of items for which ratings had to be supplied for the members of this group because of omissions in the ratings by the teacher amounted to one-third or more.

<sup>h</sup> Since 11 tested pupils in this group were rated on one pair of scales and 31 tested pupils on a different pair, a separate coefficient was obtained for the children rated on each pair.

<sup>i</sup> The information given in parentheses includes 7 cases, all girls, who were excluded in the calculation of the correlational results for Part III, but were included in the calculation of the coefficients tabulated opposite.

<sup>j</sup> One of the pupils in this group was excluded in the calculation of the correlational results because the pupil in question exceeded 16-0 years in chronological age.

<sup>k</sup> Two of the pupils in this group were excluded in the calculation of the correlational results because the pupils in question had apparently been transferred and were rated by a different teacher from the other members of the group on one or both scales.

<sup>l</sup> Two of the pupils in this group were excluded in the calculation of the correlational results because the pupils in question exceeded 16-9 years in chronological age.

<sup>m</sup> Two teachers supplied ratings of the pupils in this group, the teacher rating on one of the scales being the teacher of one of the other groups rated.

<sup>n</sup> The combined grades and classes represented in this division of the section are listed individually in the preceding division.

<sup>o</sup> The number of pupils represented by the coefficients tabulated opposite includes 7 cases, comprising all the girls in the lowest Terman Opportunity Class, who were excluded in the calculation of the correlational results for Part III.

<sup>p</sup> The number of pupils represented by the coefficients tabulated opposite includes 3 cases ranging in age between 16-0 and 17-0 years of age who were excluded in the calculation of the correlational results for Part III, but does not include 2 cases exceeding 17-0 years of age who were similarly excluded.

<sup>q</sup> Although the scales used in rating the grades or classes combined frequently differed, the number of scales pooled in obtaining the average scale conduct score for any given child for use in the calculation of the coefficients tabulated was two.

<sup>r</sup> The number of pupils represented by the coefficients tabulated opposite includes 1 case apparently transferred and rated by a different teacher from the other members of the group, who was excluded in the calculation of the correlational results for Part III.

<sup>s</sup> The number of pupils represented by the coefficients tabulated opposite includes 2 cases exceeding 16-0 years of age, who were excluded in the calculation of the correlational results for Part III.



## SECTION 3\*

STATISTICAL INFORMATION DERIVED FROM THE FREQUENCY DISTRIBUTIONS OF THE MEASURES EMPLOYED  
IN THE THREE STUDIES<sup>a</sup>

STATISTICAL INFORMATION	STUDY 1				STUDY 2 A			
	PRIVATE SCHOOL A				PRIVATE SCHOOL A			
	GRADES III, IV, V, AND VI				GRADES I, II, III, III-IV, IV, AND V-VI			
	SCS <sub>1</sub>	SCS <sub>2</sub>	SCS <sub>3</sub>	MSS	CCS	IQ		
N .....	107	107		107	62			62
Range .....	65-370	101-355		40-159	373-998			77-165
Mean .....	235.93	216.19		107.76	773.39			122.66
$\sigma$ .....	66.17	62.91		29.25	185.04			17.82
STATISTICAL INFORMATION	STUDY 2 B AND STUDY 3							
	REGULAR GRADES AND OPPORTUNITY CLASSES							
	PRIVATE SCHOOL A				PRIVATE SCHOOLS B, C, AND D			
	GRADES I, II, III, IV, AND V				GRADES I, II, III, IV, AND V-VI			
	SCS <sub>1</sub>	SCS <sub>2</sub>	IQ	MA	CA	SCS <sub>1</sub>	SCS <sub>2</sub>	IQ
N .....	91	91	91	91	91	50	50	50
Range .....	65-370	102-354	84-157	6-10-15-4	5-10-12-3	79.5-350	81-373	91-157
Mean .....	214.55	211.56	116.75	10-3.0	8-10.5	226.80	234.22	119.76
$\sigma$ .....	55.94	57.89	13.48	23.48	19.98	72.72	72.48	13.59
								MA
								CA
								50
								5-11-16-1
								10-5.1
								8-9.3
								25.21
								18.14

\* The key to symbols for Section 3 will be found on page 532.

<sup>a</sup> Although the information given in the tabulation is self-explanatory in the main, it should be noted that, whereas the ranges and the means of all mental and chronological age data are expressed in years and months, the sigmas are expressed in months only.

## SECTION 3 (Concluded)

STATISTICAL INFORMATION		STUDY 2 B AND STUDY 3 (Continued)									
		REGULAR GRADES AND OPPORTUNITY CLASSES (Concluded)									
		PUBLIC SCHOOL A									
		GRADES IB, IIA, IIB, AND IIA, AND OPPORTUNITY CLASSES IIA-IB (LOW) AND IIB-IBB (TERMAN)					OPPORTUNITY CLASSES VB-VIA (TERMAN) AND VIA (TERMAN)				
		SCS <sub>1</sub>	SCS <sub>2</sub>	IQ	MA	CA	SCS <sub>1</sub>	SCS <sub>2</sub>	IQ	MA	CA
N	.....	305	305	305	305	305	48	48	48	46	46
Range	.....	9-378	0-378	61-139	4-11-10-9	6-5-11-10	197.5-378	206.5-378	111-153	10-10-17-4	9-1-12-7
Mean	.....	218.43	230.08	96.49	7-9.5	8-2.2	310.00	320.00	130.04	13.7	10-7
$\sigma$	.....	99.07	101.13	13.41	11.22	10.40	53.52	50.21	9.97	21.77	10.99

  

STATISTICAL INFORMATION		STUDY 2 B AND STUDY 3 (Concluded)									
		UNGRADED AND BINET CLASSES									
		PUBLIC SCHOOL A					PUBLIC SCHOOL B				
		UNGRADED CLASSES I, II, III, AND IV					CLASSES FOR VERY LOW, LOW, LOW-MIDDLE, MIDDLE, MIDDLE-HIGH, AND HIGH-GRADE FEEBLE-MINDED PUPILS				
		SCS <sub>1</sub>	SCS <sub>2</sub>	IQ	MA	CA	SCS <sub>1</sub>	SCS <sub>2</sub>	IQ	MA	CA
N	.....	59	59	59	59	59	278	278	278	278	278
Range	.....	0-929	8-989.5	37-82	2-10-7-3	6-1-12-6	0-385	0-373	18-87	2-7-11-9	7-7-15-10
Mean	.....	91.86	119.80	62.59	5-0.7	8-2.1	96.51	91.18	59.80	7-4.1	12-5.5
$\sigma$	.....	56.00	52.56	10.53	13.39	18.64	74.35	74.53	10.83	17.18	23.87

KEY TO SYMBOLS

SCS Scale Conduct Score.

MSS Mental Survey Score.

CVS Chart Conduct Score.

IQ Intelligence Quotient.

MA Mental Age.

CA Chronological Age.

Subscript 1 First Measure.

Subscript 2 Second Measure.

## SECTION 4

THE STEPS IN ASSIGNING CREDIT FOR OMITTED ITEMS AND IN  
THE SUBSEQUENT CALCULATION OF THE CONDUCT SCORE*A. For the Citizenship Scales*

1. Omissions in the ratings assigned to a given pupil<sup>1</sup> were supplied by a common-sense procedure, the general rule followed being to assign for an item which had been omitted by the teacher that credit which seemed best to represent the ratings assigned to the pupil in question for the other items on that scale, whether this were the most frequent rating, the average of the two most frequent ratings, or some other figure.

2. The conduct scores based both on the items with respect to which the pupil had been rated and on the items for which credit had been assigned were determined pupil by pupil on the separate scales in routine fashion.<sup>2</sup>

*B. For the Citizenship Chart*

1. Omissions in the ratings assigned by a given teacher which affected all of her pupils<sup>3</sup> were noted, and the maximum score that would be possible on the chart as used by that teacher was ascertained.<sup>4</sup>

2. Omissions in the ratings assigned by a given teacher which affected a small number of pupils were supplied by taking the average rating assigned to the pupils who had been rated by that teacher with respect to the item in question as the credit for any pupil who had not been rated thereon.<sup>5</sup>

3. The partial conduct scores, based both on the items with respect to which all of the pupils had been rated and on the items for which credit had to be supplied in certain instances, were determined by simple addition of the credits for individual items.

4. The partial conduct scores were multiplied by whatever adjustment figure was necessary to make the scores of the teacher in question comparable to the proper maximum score of 1,000 points, rather than to that teacher's maximum score;<sup>6</sup> and the resulting figures constituted the conduct scores utilized.

<sup>1</sup> These omissions were usually unimportant, and amounted to less than one-third of the items on the paired scales except in the case of four teachers.

<sup>2</sup> A further step required when a single conduct score derived from two scales was desired was to calculate the average conduct score for the two scales, the simple mean of the conduct scores on the scales to be pooled being used.

<sup>3</sup> Or all of her pupils with one exception. Ratings assigned in rare instances to an individual pupil for one or more items with respect to which the other pupils were not rated were disregarded.

<sup>4</sup> The maximum scores for the groups included in Study 2a, in the order in which the groups are presented in Appendix III, Section 2, A, were 727, 721, 439, 528, 743, 985, 758, and 975.

<sup>5</sup> These omissions were relatively unimportant, and affected only 9 pupils.

<sup>6</sup> The adjustment figures for the maximum scores for the groups included in Study 2a (obtained by dividing 1,000 by these maximum scores in order), were 1.38, 1.39, 2.28, 1.89, 1.35, 1.02, 1.32, and 1.03.





## SECTION 2\*

A FREQUENCY DISTRIBUTION OF THE COEFFICIENTS SHOWING THE DEGREE OF RELATIONSHIP  
FOUND BETWEEN MORAL CHARACTER AND INTELLIGENCE

NON-DELINQUENT																				
TYPE OF EVIDENCE	NUMBER OF TABLE	DISTRIBUTION OF COEFFICIENTS												SUMMARY BY TYPES OF EVIDENCE						
		NEGATIVE						POSITIVE						NUMBER AND TYPE OF COEFFICIENTS	TOTAL RANGE	MEDIAN <sup>b</sup>				
		.40-.31	.30-.21	.20-.11	.10-.01	.00-.09	.10-.09	.20-.19	.30-.29	.40-.39	.50-.49	.60-.59	.70-.69				.80-.79	.90-.89		
		PART I B <sup>a</sup>																		
Ratings as to Intelligence Ratings as to Abstract Intelligence . . . . .	VII																5 r <sub>i</sub>	+ .34 to + .76	+ .46	
	VIII																43 p	- .24 to + .84	+ .60	
	IX																87 r	+ .01 to + .84	+ .48	
	VIII																14 p	+ .02 to + .85	+ .575	
Ratings as to Social Intelligence . . . . .	IX																30 r	- .04 to + .76	+ .415	
Reports of Educational Status Reports of Amount of Schooling . . . . .	IX																		+ .02 to + .72	+ .25
	IX																	4 r	+ .17 to + .33	+ .24
	VIII																	7 p	+ .13 to + .60	+ .41
	IX																	74 r	- .17 to + .78	+ .34
Reports of Educational Achievement	IX																	4 r	+ .14 to + .49	+ .295
Reports of Extra-Curricular Activities . . . . .	IX																			
	VIII																	3 p	+ .10 to + .48	+ .29
	IX																	80 r	- .35 to + .91	+ .22
Results of Intelligence Tests Results of Tests of Verbal Abstract Intelligence . . . . .	IX																	16 r	- .27 to + .24	+ .075
Results of Tests of Mechanical Intelligence . . . . .	IX																			

PART II <sup>a</sup>														
Ratings as to Intelligence Ratings as to Abstract Intelligence Ratings as to Social Intelligence Ratings as to Abstract and Social Intelligence	XIII, XIV, XVI XIII, XIV, XVI XVI	1 $\rho$	6 $\rho$ 4 $\rho$ 1 $\rho$	1 $\rho$ 4 $\rho$ 1 $\rho$	2 $\rho$ 4 $\rho$ 1 $\rho$	7 $\rho$ 6 $\rho$ 1 $\rho$	15 $\rho$ 6 $\rho$ 2 $\rho$	4 $\rho$ 6 $\rho$ 2 $\rho$	6 $\rho$ 6 $\rho$ 2 $\rho$	1 $\rho$ 4 $\rho$	43 $\rho$ 40 $\rho$ 9 $\rho$	- .26 to + .67 - .03 to + .63 - .01 to + .59	+ .34 + .54 + .325 + .39	
Reports of Educational Status														
Reports of Educational Achievement		1 $\rho$		1 $\rho$	1 $\rho$		1 $\rho$	5 $\rho$	1 $\rho$		10 $\rho$	- .19 to + .53	+ .41	
Reports of Extra-Curricular Activities		1 $\rho$	1 $\rho$			1 $\rho$	1 $\rho$	1 $\rho$		1 $\rho$	6 $\rho$	- .17 to + .70	+ .305	
PART III <sup>c</sup>														
Results of Intelligence Tests Results of Tests of Verbal Abstract Intelligence	XXIV-XXVI	1 $\rho$ 2 $\rho$ 1 $\rho$	1 $\rho$ 2 $\rho$ 12 $\rho$	1 $\rho$ 2 $\rho$ 1 $\rho$	5 $\rho$ 8 $\rho$ 1 $\rho$	1 $\rho$ 5 $\rho$ 1 $\rho$	3 $\rho$ 18 $\rho$ 3 $\rho$	2 $\rho$ 9 $\rho$ 30 $\rho$	10 $\rho$ 14 $\rho$ 33 $\rho$	1 $\rho$ 1 $\rho$ 5 $\rho$	14 $\rho$ 5 $\rho$ 67 $\rho$ 298 $\rho$ 108 $\rho$ 14 $\rho$	+ .05 to + .52 + .34 to + .76 - .24 to + .85 - .35 to + .91 - .26 to + .70 + .05 to + .52	+ .27 + .46 + .54 + .325 + .34 + .27	
SUMMARY FOR ALL TYPES OF EVIDENCE BY INDIVIDUAL TABLES OR SERIES OF TABLES														

\* The footnotes to Section 2 will be found on page 535.

## APPENDIX V

### SELECTED BIBLIOGRAPHY<sup>1</sup>

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# INDEX OF AUTHORS

- Abbott, E., 73, 74, 75, 84, 85, 538  
 Adler, H. M., 80, 86, 538  
 Allport, G. W., 138, 545  
 Anderson, J. E., 80, 85, 86, 538  
 Anderson, V. V., 70, 84, 538  
 Aschaffenburg, G., 71, 72, 73, 82, 538  
 Asher, E. J., 81, 82, 538  
 Auden, G. A., 71, 73, 84, 87, 538
- Barnes, C. B., 72, 538  
 Barr, A. S., 163, 171, 545  
 Beery, R. C., 346, 545  
 Berry, C. S., 71, 538  
 Bingham, A. T., 73, 75, 84, 87, 538  
 Bowers, P. E., 71, 73, 539  
 Brandenburg, G. C., 148, 149, 150, 152, 153, 182, 184, 545  
 Breckinridge, S., 73, 74, 75, 84, 85, 538  
 Bridges, J. W., 79, 86, 88, 539  
 Bridges, K. M. B., 79, 86, 88, 539  
 Bronner, A. F., 16, 71, 72, 78, 85, 87, 426, 539, 540  
 Brown, R. M., 73, 543  
 Brown, W. S., 149, 545  
 Burt, C., 16, 37, 57, 58, 60, 61, 62, 63, 75, 79, 93, 441, 458, 459, 539
- Cady, V. M., 16, 138, 154, 161, 165, 173, 182, 184, 187, 200, 539, 545  
 Cattell, J. McK., 200, 545  
 Chapman, J. V., 73, 543  
 Character Education Inquiry, 138, 469, 473, 474, 484, 487, 492, 545  
 Chassell, C. F., 115, 116, 117, 173, 187, 210, 211, 212, 213, 345, 354, 466, 467, 545, 549  
 Chassell, E. B., 345, 545  
 Chassell, L. M., 158, 166, 180, 190, 191, 345, 346, 466, 467, 502, 545  
 Clark, W. W., 74, 75, 84, 119, 120, 124, 539  
 Clem, O. M., 146, 168, 186, 546  
 Cleveland Foundation, 73, 80, 539  
 Cobb, J. O., 72, 539  
 Cornell, W. S., 74, 75, 85, 539  
 Cowdery, K. M., 74, 75, 85, 539  
 Crafts, L. W., 16, 539  
 Curti, M. W., 16, 539  
 Cushing, H. M., 119, 121, 125, 539
- Dawley, A., 16, 73, 74, 75, 77, 86, 87, 97, 98, 99, 100, 101, 102, 112, 119, 120, 121, 124, 127, 458, 540  
 Dewey, J., 202, 204, 546  
 Doll, E. A., 74, 75, 80, 84, 88, 449, 539  
 Drucker, A. P., 74, 75, 84, 86, 87, 540
- East, W. N., 71, 540  
 Erskine, J., 3, 546
- Farrell, E. E., 70, 84, 540  
 Fernald, G. M., 495, 540  
 Fernald, M. R., 16, 73, 74, 75, 77, 86, 87, 97, 98, 99, 100, 101, 102, 112, 119, 120, 121, 124, 127, 458, 540  
 Fernald, W. E., 71, 540  
 Flemming, C. W., 154, 157, 161, 164, 168, 171, 173, 174, 181, 182, 185, 186, 187, 191, 546  
 Folsom, J. K., 138, 158, 171, 190, 191, 466, 467, 546  
 Fretwell, E. K., 154, 161, 169, 181, 546
- Garrett, H. E., 243, 253, 461, 462, 490, 546  
 Gault, R. H., 16, 72, 540  
 Glueck, B., 73, 540  
 Goddard, H. H., 39, 71, 72, 540  
 Goring, C., 61, 71, 72, 97, 98, 99, 101, 102, 104, 105, 106, 107, 109, 110, 111, 112, 113, 114, 124, 144, 458, 488, 490, 540, 546  
 Gruhle, H. W., 16, 72, 74, 75, 85, 540  
 Guilford, J. P., 80, 86, 544
- Haines, T. H., 74, 75, 79, 80, 84, 85, 542  
 Hamill, G., 80, 86, 88, 540  
 Hartshorne, H., 138, 139, 473, 489, 506, 507, 547  
 Hayes, M. H. S., 16, 73, 74, 75, 77, 86, 87, 97, 98, 99, 100, 101, 102, 112, 119, 120, 121, 124, 127, 458, 540  
 Healy, W., 72, 78, 85, 87, 116, 117, 449, 495, 496, 499, 540, 543  
 Heron, D., 60, 63, 458, 542  
 Hill, A. C., 73, 82, 86, 540  
 Hill, H. F., 39, 540  
 Hoag, E. B., 422, 541  
 Hollingworth, H. L., 138, 200, 546  
 Hollingworth, L. S., 139, 546  
 Hughes, W. H., 161, 165, 174, 546
- Inglis, A., 381, 546  
 Irle, K. W., 154, 159, 163, 166, 181, 547
- Johnson, E. H., 74, 75, 541
- Kammerer, P. G., 75, 85, 87, 541  
 Kauffmann, M., 500, 541  
 Kelly, T. L., 16, 62, 63, 76, 154, 161, 169, 181, 253, 363, 429, 430, 447, 489, 541, 546, 547  
 Kneeland, J. J., 73, 541  
 Knollin, H. E., 446, 547  
 Kohs, S. C., 16, 70, 154, 159, 163, 166, 181, 541, 547  
 Kornhauser, A. W., 154, 159, 163, 167, 181, 182, 547  
 Kuhlmann, F., 437, 541

- Laslett, H. R., 121, 124, 175, 541, 547  
 Leeper, R. D., 72, 541  
 Ley, A., 71, 541  
 London County Council, 60, 92, 93, 94,  
 111, 459, 541  
 Lund, D., 16, 72, 541
- Malzberg, B., 71, 541  
 Maris, C. L., 77, 79, 86, 87, 88, 541  
 Mathews, J., 74, 75, 84, 541  
 May, M. A., 138, 139, 157, 165, 167, 171,  
 447, 473, 481, 489, 506, 507, 547  
 Merrill, M. A., 70, 84, 541  
 Mertz, P. A., 72, 73, 542  
 Miner, J. B., 5, 16, 27, 28, 39, 40, 41, 43,  
 70, 75, 76, 84, 95, 105, 111, 159, 163,  
 165, 448, 542, 547  
 Miner, Z. F., 253, 363, 549  
 Minnesota State Board of Control, Di-  
 vision of Research, 78, 79, 85, 542  
 Missouri Association for Criminal Justice,  
 Survey Committee, 74, 86, 87, 542  
 Mitchell, D., 16, 542  
 Moore, H. T., 159, 547  
 Murchison, C., 71, 74, 80, 86, 88, 443, 542
- National Academy of Sciences, 46, 47, 74,  
 80, 87, 442, 542  
 National Education Association, 138, 200,  
 547  
 National Research Council, 138, 547  
 National Society for the Study of Educa-  
 tion, 447, 547  
 New York State Commission of Prisons,  
 16, 76, 542  
 Norsworthy, N., 200, 547
- Ordahl, G., 74, 75, 84, 86, 87, 542  
 Otis, A. S., 446, 488, 490, 547  
 Otis, M., 74, 84, 542
- Partlow, W. D., 74, 75, 79, 80, 84, 85,  
 542  
 Paterson, D. G., 16, 40, 76, 543  
 Patterson, H. L., 510, 548  
 Pearson, K., 60, 63, 144, 145, 186, 420,  
 458, 542, 548  
 Pennsylvania State Department of Public  
 Instruction, 75, 542  
 Pintner, R., 16, 40, 72, 76, 542, 543  
 Poffenberger, A. T., 491, 548  
 Porteus, S. D., 70, 543  
 Poull, L. E., 74, 75, 77, 85, 87, 88, 543
- Raubenheimer, A. S., 16, 121, 157, 175,  
 188, 489, 543, 548  
 Riebesell, P., 16, 543  
 Roback, A. A., 16, 138, 543, 548  
 Robson, M. M., 163, 548  
 Rosenquest, C. M., 73, 74, 84, 86, 543  
 Ross, C. C., 165, 166, 169, 548  
 Ruch, G. M., 119, 121, 125, 539  
 Ruger, G. J., 16, 542  
 Rugg, H., 343, 439, 548
- Shen, E., 373, 548  
 Shrubsall, F. C., 78, 79, 82, 87, 543  
 Slawson, J., 16, 60, 61, 65, 77, 78, 79, 80,  
 81, 82, 85, 86, 87, 88, 92, 93, 94, 95,  
 99, 101, 111, 119, 121, 122, 123, 125,  
 127, 450, 458, 459, 543  
 Smith, G. B., 70, 80, 84, 543  
 Somers, G. T., 154, 159, 163, 167, 172,  
 182, 548  
 Spaulding, E. R., 72, 73, 74, 86, 87, 543  
 Stead, H. G., 153, 165, 183, 548  
 Stearns, A. W., 73, 543  
 Steiner, J. F., 73, 543  
 Stone, C. P., 77, 78, 85, 86, 87, 543  
 Sumner, F. B., 200, 548  
 Sutherland, E. H., 16, 73, 543  
 Symonds, P. M., 138, 548
- Tasmania State Psychological Clinic, 78,  
 85, 86, 543  
 Terman, L. M., 16, 72, 139, 176, 441,  
 491, 492, 506, 544, 548, 549  
 Thorndike, E. L., 4, 5, 158, 178, 242, 248,  
 295, 438, 439, 462, 549  
 Toops, H. A., 146, 157, 170, 176, 177,  
 178, 186, 187, 188, 253, 363, 489, 549  
 Town, C. H., 71, 72, 544  
 Tredgold, A. F., 70, 71, 72, 73, 84, 87,  
 544  
 Tufts, J. H., 546
- United States Bureau of Education, Di-  
 vision of Statistics, 73, 425, 544, 549  
 United States Bureau of Education, Sta-  
 tistical Division, 423, 549  
 United States Bureau of Labor, 73, 84,  
 544  
 United States Bureau of the Census, 73,  
 74, 84, 84-85, 226, 544, 549  
 United States Office of Education, 425,  
 549  
 Upton, S. M., 344, 545, 549
- Villamor, I., 73, 86, 544  
 Voelker, P. F., 157, 177, 188, 549
- Wallace, D., 71, 74, 75, 85, 544  
 Wallin, J. E. W., 16, 40, 70, 71, 72, 73,  
 74, 76, 84, 87, 144, 449, 544, 549  
 Watson, G. B., 138, 550  
 Webb, E., 138, 151, 153, 154, 157, 159,  
 160, 162, 164, 167, 172, 177, 181, 182,  
 183, 184, 185, 190, 191, 466, 467, 550  
 Weber, C. O., 80, 86, 544  
 Weidensall, J., 72, 75, 85, 544  
 Welty, R. E., 138, 139, 506, 507, 547  
 Williams, E. H., 422, 541  
 Williams, J. H., 16, 72, 74, 75, 76, 77,  
 78, 85, 87, 88, 544  
 Witmer, L., 71, 544  
 Woodrow, H. A., 151, 154, 550  
 Woods, F. A., 3, 4, 144, 550  
 Worthington, M. R., 80, 86, 538
- Young, K., 138, 550  
 Yule, G. U., 57, 488, 550

## INDEX OF SUBJECTS\*

- Account, general, of criteria employed in evaluation of data, 254-258
- Account of
  - Construction of relatively objective measures of morality, 342-346
  - Procuring of data, 220-224
  - Statistical reduction of non-correlational studies, 52-65
  - Statistical treatment of data, 241-253
- Adult Criminals, 71, 73, 74, 75, 76, 77, 78, 80, 98-99, 104, 105-107, 120, 130, 131, 132, insert
- Alcoholics, 72, 74, 130, 131, insert
- Analysis of correlational results in terms of
  - Countries, 416-417
  - Types of coefficients, 417-418
  - Types of evidence, 412-414
  - Types of groups, 415-416
- Analysis of effect of
  - Chance inaccuracies in original measures, 462-468
  - Different types of evidence, types of groups, countries, and types of coefficients, 431-462
  - Different types of subjects, 419-431
- Analysis of final grades and composite scores obtained as result of application of criteria employed, 258-260
- Analysis of findings of Character Education Inquiry, 473-484
- Analysis of geographical location, affiliation or control, and type of institution, 225-227
- Analysis of individual coefficients tabulated in three parts of research, 534-537
- Analysis of information regarding data
  - Qualitative, 236-240
  - Quantitative, 231-235
- Analysis of three primary methods of classification employed in research as applied to
  - Studies in feeble-minded and delinquent groups, 18-19
  - Studies in non-delinquent groups, 140-141
- Australia, 78, 131, insert
- Aviation Cadets, 158, 194, insert
- Belgium, 71, 130, insert
- Bibliography, selected, 538-550
- Boy Scouts, 177, 195, insert
- Calculation of
  - Coefficients of colligation, 57-65
  - Pooled percentages, 52-57
- Canada, 77, 79, 132, insert
- Central Europe, 72, 130, insert
- Coefficients of colligation between measures of delinquency and mental inferiority
  - Obtained by statistical reduction of non-correlational studies, 67-91
  - Reported in literature, 91-96
- Coefficients of correlation between
  - College marks and extra-curricular activities, 327-330
  - Conduct score and intelligence quotient, 374-378
  - Conduct score and mental survey score, 364-366
  - Conduct score, mental age, and chronological age, 384-391
- Measures of delinquency and mental inferiority
  - Product-moment, 118-128
  - Rank-difference, 114-118
  - Tetrachoric, 103-114
- Measures of moral character and intelligence
  - Product-moment, 156-192
  - Rank-difference, 147-156
  - Tetrachoric, 143-147
- Ratings in moral and intellectual traits and composites of ratings in moral and intellectual traits, 283-287
- Ratings in moral and intellectual traits by
  - Faculty judges, 261-267
  - Student judges, 267-275
- Ratings in moral and intellectual traits or their composites and
  - College marks, 303-311
  - Extra-curricular activities, 319-327
- Coefficients of correlation, partial, between conduct score and mental age with chronological age constant, 384-391
- Coefficients of correlation, supplementary, calculated
  - Between scores in conduct and intelligence, 526-530
  - For selected institutions, 512-513
- Coefficients of cross-correlation between ratings by faculty judges and ratings by student judges, 287-293
- Coefficients of intercorrelation between ratings in moral traits by student judges, 275-283
- College Graduates, 158, 166, 194, insert, 466, 467
- College Students, 148-149, 149-151, 158-161, 163-164, 165, 166-167, 171, 171-

\* Page references are supplied for the three primary methods of classification utilized in the research in terms of types of evidence, types of groups, and countries only in the case of tabular data in which these three methods of classification are preserved.

- 173, 194, 195, 210-213, 334-335, 402, insert, 466, 467
- Comparison between
- Quantitative and qualitative method of weighting correlational results of investigation, 337-338
  - Uncorrected and corrected coefficients of correlation as to relation between morality and intellect, 463-468
- Comparison of correlational results for
- Different countries with identical types of evidence, types of groups, and types of coefficients, 451-456
  - Different types of coefficients with identical types of evidence, types of groups, and countries, 456-462
  - Different types of evidence with identical types of groups, countries, and types of coefficients, 432-444
  - Different types of groups with identical types of evidence, countries, and types of coefficients, 444-450
- Comparison of feeble-minded, delinquent, and non-delinquent groups with respect to restriction in range, 420-431
- Comparison of three parts of research as to
- Correlational results, 401-404
  - Types of evidence, types of groups, and countries, 399-401
- Compilation of correlational results of
- Investigations of relation between morality and intellect, 409-410
  - Studies of relation between
    - Conduct and intelligence, 394-396
    - Moral and intellectual traits, 333-337
- Conclusion, final, of research as to relation between morality and intellect, 470-473
- Consideration of value as measure of intelligence of
- Records of college marks, 294-295
  - Reports of extra-curricular activities, 312-313
- Consideration of various factors which affect correlational results of research, 419-468
- Construction of measures of morality utilized in investigation of relation between conduct and intelligence, 341-348
- Correlational results' obtained for non-selected institutions, 512-517
- Correlation ratios between measures of delinquency and mental inferiority, 96-103
- Definition of standards for criteria employed in evaluation of data with grades assigned as result of each criterion, 518-521
- Description, brief, of two measures of morality utilized in investigation, 346-348
- Citizenship chart, 347-348
  - Citizenship scales, 346-347
- Description, concrete, of typical institutions contributing to conclusions of study, 218-219
- Description of data and subjects represented in study employing as measure of intelligence
- Intelligence quotient, 367-371
  - Mental age, 379-380
  - Mental survey score, 360-361
- Description of data obtained for study involving
- Records of college marks, 296-297
  - Reports of extra-curricular activities, 313-315
- Description of judges, 229-230
- Description of method of recording data, 241-242
- Description of procedures utilized in securing aid of judges, 222-224
- Description of studies reviewed in investigation of relation between
- Delinquency and mental inferiority, 16-18
  - Moral character and intelligence, 137-140
- Description of subjects, 227-229
- Determination of
- Main outlines of investigation of relation between moral and intellectual traits, 199-206
  - Reliability of measures constructed, 348-352
- Estimates of Mental Deficiency, 71-72, 98, 104, 105-106, 130, insert
- Estimates of mental deficiency in paired delinquent and non-delinquent groups, 26-29
- Europe, 144, 194, insert
- Explanation of coefficient of colligation and its use in investigation, 57-59
- Explanation of evaluation of data, 254-260
- Explanation of general plan followed in studies of relation between moral and intellectual traits, 199-208
- Explanation of method of
- Combining coefficients of correlation for
    - All types of subjects, 405-408
    - College students, 331-333
    - School children, 392-393
  - Measuring morality employed in studies of relation between conduct and intelligence, 341-352
- Explanation of procedures required in
- Correlational analysis of data, 247-253
  - Determining correlation with
    - College marks, 297-303
    - Extra-curricular activities, 315-319
    - Intelligence quotient, 371-373
    - Mental age, 380-383
    - Mental survey score, 361-363
- Feeble-Minded Children in Public Schools, 71, 130, insert
- Feeble-Minded Persons at Large in Community, 70, 130, insert
- Feeble-Minded Persons in Institutions, 70, 130, insert
- Findings of Character Education Inquiry as independent evidence of relation between morality and intellect, 473-487



- France, 73, 130, insert  
 Frequency distribution of coefficients showing degree of relationship found between  
   Delinquency and mental inferiority, 534-535  
   Moral character and intelligence, 536-537
- General Feeble-Minded Population, 70, 130, insert  
 General Population, 144, 194, insert  
 Germany, 71, 72, 73, 74, 75, 130, 131, insert  
 Great Britain, 70, 72, 73, 74, 75, 78, 79, 92, 93, 98, 99, 104, 105-107, 130, 131, 132, 144, 149, 151, 159-161, 162-163, 164, 165, 167, 172-173, 177, 194, 195, insert, 466, 467  
 Great Britain and Ireland, 71, 130, insert
- Information, detailed, regarding data utilized in three studies, 526-530  
 Information, statistical, derived from frequency distributions of measures employed in three studies, 531-532  
 Interpretation, graphic, of correlational results of research, 411-418
- Justification of correlational procedure employed in statistical reduction, 59-65  
 Juvenile Delinquents, 72, 73, 74, 75, 76-77, 77, 78-79, 79, 80-81, 92-93, 99, 105, 116, 120-121, 122-123, 130, 131, 132, insert
- Key to  
   Institutions cooperating in investigation of relation between moral and intellectual traits, 509-510  
   Schools included in investigation of relation between conduct and intelligence, 525
- Material, supplementary, pertaining to  
   Part I, 495-508  
   Part II, 509-524  
   Part III, 525-533
- No Specific Country, 70, 130, insert
- Outline of  
   Methods employed in obtaining cooperation of institutions, 220-222  
   Procedure, 6-12  
   Three studies, 357-358  
   Treatment of faulty data, 242-246
- Philippine Islands, 73, 130, insert  
 Point systems, adapted, used in evaluation of extra-curricular activities, 522-524  
 Porto Rico, 73, 131, insert  
 Presentation and interpretation of correlational results for  
   College marks, 303-311  
   Extra-curricular activities, 319-330  
   Intelligence quotient, 374-378  
   Mental age, 384-391
- Mental survey score, 363-366  
 Ratings by faculty and student judges, 261-293  
 Principles of selection followed in excluding certain measures of character and personality and in classifying ratings as to intelligence, 506-508
- Ratings as to Abstract and Social Intelligence, 211-212, 334, insert, 466  
 Ratings as to Abstract Intelligence, 144, 148-149, 158-163, 194, 210-211, 334, 402, insert, 466  
 Ratings as to Intelligence, 144, 148-150, 158-165, 194, 210-212, 334, 402, insert, 466  
 Ratings as to Social Intelligence, 149-150, 163-165, 194, 211, 334, 402, insert, 466  
 References utilized in studies of relation between  
   Delinquency and mental inferiority, 538-544  
   Moral character and intelligence, 545-550  
   Relation between  
     Moral and volitional character and social intelligence, 482-484  
     Moral character and abstract intelligence, 475-481  
     Volitional character and abstract intelligence, 481-482  
 Reliability coefficients for paired citizenship scales in  
   Combined grades or classes, 350-351  
   Single grades or classes, 348-349  
 Reliability of  
   Citizenship chart as determined by split test method, 351-352  
   Citizenship scales as determined by comparable test method, 348-351  
 Reports concerning Delinquency, 70-71, 130, insert  
 Reports concerning delinquency in paired feeble-minded and non-feeble-minded groups, 23-25  
 Reports of Amount of Schooling, 74-75, 98-99, 106, 120, 131, 165, 194, insert  
 Reports of Educational Achievement, 75, 92, 107, 131, 150-151, 166-171, 194-195, 212-213, 335, 402, insert, 467  
 Reports of Educational Status, 73-75, 92, 98-99, 106-107, 120, 130-131, 150-151, 165-171, 194-195, 212-213, 335, 402, insert, 467  
 Reports of educational status in paired delinquent and non-delinquent groups, 29-38  
   Reports of amount of schooling, 32-34  
   Reports of educational achievement, 36-38  
   Reports of illiteracy, 30-32  
   Reports of school progress, 34-36  
 Reports of Extra-Curricular Activities, 171, 195, 213, 335, 402, insert, 467  
 Reports of Illiteracy, 73-74, 130-131, insert  
 Reports of School Progress, 75, 131, 165-166, 194, insert

- Results of Army Mental Tests, 80, 132, insert
- Results of Intelligence Tests, 76-81, 92-93, 99-100, 105, 116, 120-123, 131-132, 151, 171-178, 195, 354-355, 395, 402, insert, 467
- Results of intelligence tests in paired delinquent and non-delinquent groups, 38-51
  - Results of army mental tests, 46-48
  - Results of tests of mechanical intelligence, 50-51
  - Results of tests of non-verbal concrete intelligence, 48-50
  - Results of tests of verbal abstract intelligence, 39-46
    - Earlier results, 39-43
    - Later results, 43-46
- Results of Tests of Mechanical Intelligence, 81, 123, 132, 177-178, 195, insert
- Results of Tests of Non-Verbal Concrete Intelligence, 80-81, 93, 116, 122, 132, insert
- Results of Tests of Verbal Abstract Intelligence, 76-79, 92-93, 99-100, 105, 116, 120-121, 131-132, 151, 171-177, 195, 354-355, 395, 402, insert, 467
- Review, abridged, of non-correlational studies of relation between delinquency and mental inferiority, 20-51
- Review, tabular, of
  - Correlational studies of relation between Delinquency and mental inferiority, 66-128
  - Moral character and intelligence, 142-192
  - Investigation of relation between
    - Conduct and intelligence, 353-356
    - Moral and intellectual traits, 209-214
- Royalty, 144, 194, insert
- Rules, detailed, governing report and interpretation of routine correlational results obtained for selected institutions, 511
- Rules followed in
  - Calculating pooled percentages, 55-57
  - Selecting most significant data from detailed tables of tabular review, 53-55
- School Children, 144, 149, 151, 161-163, 164-165, 165-166, 168-171, 171, 173-177, 177-178, 194, 195, 354-355, 395, 403, insert, 466, 467
- Selection of
  - Method, 200
  - Subjects and judges, 201
  - Traits, 201-206
- Sex Offenders, 72, 73, 75, 77, 79, 100, 121, 130, 131, 132, insert
- Significance of relationship revealed in research, 488-492
- Statement of problem, 3-5
- Steps in assigning credit for omitted items and in subsequent calculation of conduct score, 533
- Study, analytical, of
  - Cooperating institutions and of persons who served as subjects or judges, 225-230
  - Returns, 231-240
- Study, comparative, of three parts of research, 399-404
- Study of correlation between
  - Conduct score and
    - Intelligence quotient, 367-378
    - Mental age, 379-391
    - Mental survey score, 360-366
  - Ratings in moral and intellectual traits and
    - College marks, 294-311
    - Extra-curricular activities, 312-330
- Study of relation between
  - Character and intellect, 502-505
  - Delinquency and mental deficiency, 495-501
- Study of returns
  - Qualitative, 236-240
  - Quantitative, 231-235
- Summary and evaluation of findings of research as to relation between morality and intellect, 469-492
- Summary of
  - Data obtained from private and public schools, 358-359
  - Findings of Character Education Inquiry, 484-487
  - Returns received from faculty and student judges, 215-217
- Supplementation of principal study, 206-208
- Survey, brief, of studies of relation between
  - Delinquency and mental inferiority, 15-19
  - Moral character and intelligence, 137-141
- Survey, preliminary, of
  - Studies of correlation between scores in conduct and intelligence, 357-359
  - Study of correlation between ratings in moral and intellectual traits, 215-219
- Sweden, 72, 130, insert
- Synthesis of investigation of relation between
  - Conduct and intelligence, 392-396
  - Moral and intellectual traits, 331-338
- Synthesis of several investigations of relation between morality and intellect included in research, 405-418
- Synthesis of studies of relation between Delinquency and mental inferiority, 129-134
  - Moral character and intelligence, 193-196
- United States, 70, 71, 72, 73, 74, 75, 76-77, 78, 78-79, 79, 80-81, 92-93, 93, 98, 99-100, 105, 116, 120-123, 130, 131, 132, 148-149, 149-151, 151, 158-159, 161, 163, 164-165, 165-167, 168-172, 173-176, 177-178, 194, 195, 210-213, 334-335, 354-355, 395, 402-403, insert, 466, 466-467, 467
- United States and Canada, 73, 130, insert





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T.C.

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